

69
EDUCATION

Its Data and First Principles

by

Sir PERCY NUNN

THIRD EDITION, COMPLETELY
REVISED AND RESET

EDWARD ARNOLD (PUBLISHERS) LTD.

SIR PERCY completed the revision himself and sent the finished MS. of this third edition of his famous book to England a few weeks before his death. Owing to the difficulties and delays in communication with Madeira, where he had been living for some years, he had not only checked carefully every detail of the MS. but had made arrangements for proof-corrections on his behalf in this country, arrangements which have been carried out.

The whole book has been very thoroughly revised by him, the existing text considerably expanded and in some places re-written, and he has added a new chapter on intelligence testing, a subject which has become of increasing importance and public interest not only because of the conspicuous research work done on it by British psychologists but because of the use of these tests in the services and industry during the war.

The book has been seen through the press by Professors F. A. Cavanagh and Cyril Burt, and by Miss Margaret Punnett, a former colleague of Sir Percy's at the Institute of Education.

~~769~~
~~3843~~

8/4

~~769~~

769

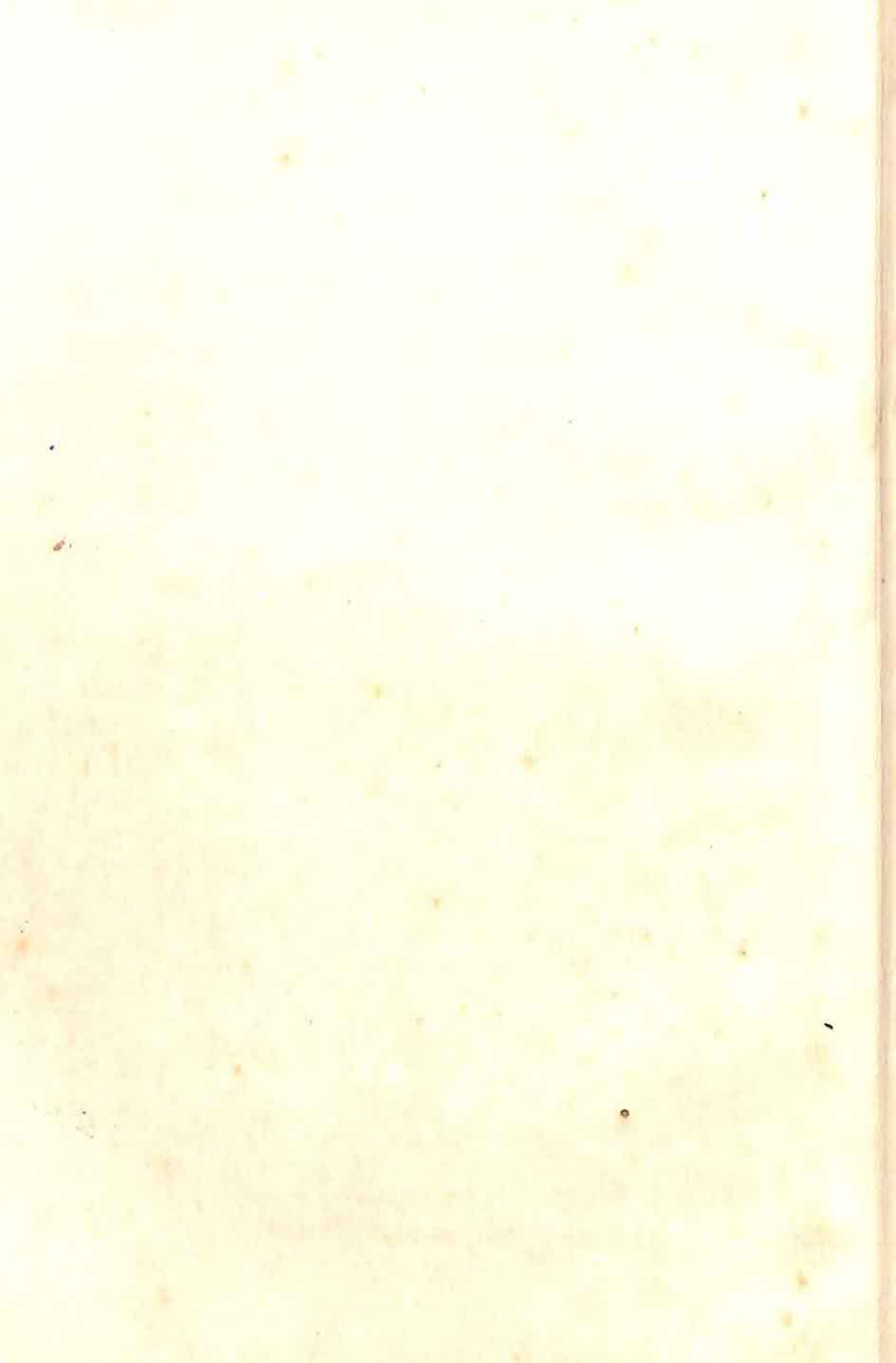
123





EDUCATION
Its Data and First Principles





EDUCATION

Its Data and First Principles

By

SIR PERCY NUNN

THIRD EDITION

Revised and in part rewritten



LONDON

EDWARD ARNOLD (PUBLISHERS) LTD.

© Copyright

First Published, 1920

*Reprinted, 1920, 1921, 1922 (3 times), 1923, 1924, 1925,
1926, 1927, 1928, 1929 (twice)*

Second Edition, 1930

Reprinted, 1930, 1931, 1933, 1934, 1935, 1936, 1937, 1941

Third Edition, 1945

Reprinted, 1947, 1949, 1956, 1960, 1963

30.7.93

7193

370

NUN

Preface

In the preface to the first edition of this book I stated that it was addressed to two classes of readers : to professional students, to whom it offered a preliminary survey of the whole field of educational theory and practice ; and to that wider public whose enlightened interest in the greater issues is the mainspring of social progress. In the hope of increasing its usefulness a fresh revision of the work, including considerable expansion and some rewriting of the former text, is now offered ; for, since the second edition appeared, a drastic remoulding of our school system has brought the fundamental problems of education into clearer relief and made them, as never before, the subject of debate and criticism among laymen equally with teachers and administrators. Thus it has become desirable both to treat more fully old questions that have risen to new importance and also to give to questions that have newly emerged their due place in the argument of the book.

The significance and the value of 'intelligence tests' have been the subject of researches in which—following the great lead given by Professor C. Spearman, F.R.S.—British psychologists have long been conspicuous ; and recent legislation has sharpened public curiosity about them. These facts, especially the second, seemed to justify the addition of a new chapter which should explain in simple terms the ideas underlying the theory of the tests and should illustrate the highly important part they are likely to play in educational administration. In writing it I have been careful not to create difficulties for readers whose mathematical memories do not go beyond the rules of arithmetic and who take little pleasure in applying even those ; but, for others, with a keener appetite for demonstration, a few lines of algebra have been provided in an appendix to the chapter.

The central thesis of the book remains unchanged : it maintains that the primary aim of all educational effort should be to help boys and girls to achieve the highest degree of individual development of which they are capable. A widespread acceptance of this idea is a striking and, it is to be hoped, a permanent by-product of

the war years ; but there is still some disposition to suspect that one who embraces it too heartily may be led to undervalue the just claims of public duty and social service. As a comment upon this suspicion I venture, imitating Plato's famous procedure, to apply to the individual members of a single community what the late Lord Balfour said in 1911 about a coalition of free and self-governing communities, ' who feel that they are never more themselves, never more masters of their own fate, than when they recognize that they are parts of a greater whole, from which they can draw inspiration and strength, and to which they can give inspiration and strength.' ¹ The reader will, in fact, find that the argument of the following pages conforms throughout with the doctrine set forth in this eloquent passage.

In carrying out the revision I have been helped by several generous friends : by Professor F. A. Cavenagh, of King's College, London (whom I have long regarded as my better literary conscience), Mrs. E. M. Schooling and Mr. G. Walter Grabham, O.B.E., whose judgment on many points I have gladly followed ; by my former colleague, Miss Margaret Punnett, who has most kindly performed essential offices that my remoteness from the scene prevented me from undertaking myself ; by Professor Cyril Burt, of University College, London, and Dr. C. S. Myers, F.R.S., Founder of the National Institute of Industrial Psychology, whose valuable observations, privately communicated, I have not, I hope, perverted to heretical uses ; by my daughter, Miss Elsa Nunn, Principal of Fishponds Training College, and Miss D. E. May, Lecturer in the same institution, whom I have consulted mainly on questions concerning the teaching of very young children. I have also to thank Messrs. Macmillan and the Editors of *Educating for Democracy* for permission to incorporate in my first chapter a passage from the essay I contributed to that composite work.

T. P. NUNN.

¹ Quoted from the ' Old and True ' extract in *The Times* for January 28, 1944.

Contents

<i>Chapter</i>	<i>Page</i>
PREFACE	5
I. THE AIM OF EDUCATION	9
II. LIFE AND INDIVIDUALITY	18
III. THE WILL TO LIVE	32
IV. THE LIVING PAST	41
V. THE RELATIONS BETWEEN HORME AND MNEME	50
VI. ROUTINE AND RITUAL	68
VII. PLAY	79
VIII. FREEDOM IN EDUCATION	99
IX. NATURE AND NURTURE	113
X. MENTAL MEASUREMENT	129
XI. MIMESIS	153
XII. INSTINCT	169
XIII. THE GROWTH OF THE SELF	181
XIV. THE MECHANISM OF KNOWLEDGE AND ACTION	204
XV. THE DEVELOPMENT OF INTELLECT	220
XVI. THE SCHOOL AND THE INDIVIDUAL	247
INDEX	277

CHAPTER I

The Aim of Education

'Every art,' said Aristotle in his famous exordium, 'is thought to aim at some good.' Now education, as we shall consider it in this book, is certainly an art. It is reasonable, then, to begin by asking at what good it aims.

There is no lack of confident answers to the question. The purpose of education, one says, is to form character; another, to prepare for complete living; a third, to produce a sound mind in a sound body; and the series of replies of this kind could easily be continued. All of them seem satisfactory until, pursuing the matter farther, we ask what kind of character it is desirable to 'form,' what activities 'complete living' includes, or what are the marks of a healthy mind. We then find, as M. W. Keatinge¹ has trenchantly pointed out, that the success of these attempts to state a universal aim for education is largely illusory, being due chiefly to the fact that every one may, within wide limits, interpret them just as he pleases. For A.'s idea of a fine character turns out to be either ridiculous or rankly offensive to B.; what C. regards as complete living would be a spiritual death for D.; while the *mens sana in corpore sano* that E. reveres, F. loathes as the soul of a prig housed in the body of a barbarian. In face of such discoveries a cynic might declare that the real use of the maxims we have quoted is to conceal, as behind a verbal fog-screen, differences of educational faith and practice too radical to be harmonized and too serious to be exposed to the public view.

The origin of these unhappy differences is easily disclosed. Every scheme of education being, at bottom, a practical philosophy, necessarily touches life at every point. Hence any educational aims which are concrete enough to give definite guidance are correlative to ideals of life—and, as ideals of life are eternally at variance, their conflict will be reflected in educational theories. For instance, if the 'Greek view of life' cannot be reconciled with that of the

¹ *Studies in Education* (Black, 1916).

Puritan reformers, it is idle to look for harmony between the conceptions of education that sprang from them.¹ Moreover, it is not only true that no ideal of life has for long reigned unchallenged over civilized men, even of the same race and nation; we must also recognize that among the nominal followers of an ideal there are always rival sections, doubtful adherents and secret rebels. Is it wonderful, then, that the prophets of education constantly gainsay one another and that the plain man knows not where to turn for truth?

The root of the trouble doubtless lies in the complexity of human nature, and especially in one of its strangest paradoxes. From one standpoint men seem like solitary inhabitants of islands, each sundered from the rest by an impassable sea. Your spirit, for example, and mine can communicate indirectly and clumsily by means of the sounds our lips utter and the written or printed marks our fingers frame; but there is no direct touch between us and no community of being: you are for ever you and I, I. Yet from another standpoint men are seen most truly to be every one members one of another. We come into the world with minds almost as empty as our bodies are naked; and just as our bodies are clothed by others' hands, so our spirits are furnished with what enters into them from other spirits. Stripped of these borrowings we could hardly live, and should certainly be less than human.

When men philosophize about life they are prone to lay exclusive stress upon one or other of its contradictory aspects. Thomas Hobbes's famous book, *Leviathan* (1651), is a classical presentation of the theory that, in the state of nature, men were independent and self-sufficient units, perpetually at war, each with all the others. According to Hobbes, an escape from this universal strife was found only when a body of men contracted with one another to surrender their individual rights (save the right of self-preservation) to a supreme representative authority, to be exercised for their common security and interests. It was thus 'that great Leviathan called the Commonwealth or State' came into being. In the philosophy of G. F. Hegel (1770-1831), which has had an enormous influence upon the political thought and activity of continental

¹ This point is elaborated by Sir F. Clarke in *Education and Social Change* (Sheldon Press, 1940), Ch. I.

Europe,¹ Hobbes's order is completely reversed; society, instead of being the offspring of man's invention, becomes now the parent of his spiritual being. Conceived in the hardened form of the State, it is a super-personal entity of which the single life is but a fugitive element—an age-long spiritual life from which the individual spirit, with its private will and conscience, draws whatever measure of reality it possesses.

The theoretical controversy which has swung between these extreme limits may be said to be always with us; for in one way or another it still affects the attitude towards education of very many who would be astonished if they were called philosophers. Expressed crudely, the question in debate is whether a child should be educated for himself or for the service of society (or the State) or for some combination of the two ends. Our first task, then, must be to define our attitude towards that question as clearly as can be done at the outset of the inquiry.

It² is a trite remark that man is a social animal, and that the 'herd instinct' that makes him such is the source of all civilization and of all human worth. There is little need to restate the arguments that lead to this far-reaching conclusion; it is sufficiently plain that a man becomes what he becomes mainly as the result of his reactions to his social environment—the influence upon him of intercourse with parents and brethren, of schoolfellows and schoolmasters, companions and rivals, friends and enemies, employers and employees. It is, moreover, easy to recognize the deep influence which the 'social heritage'—the whole body of traditions and institutions of a people—has upon the growth and structure of the individual mind. To deny or to seek to minimize these patent facts would be to exhibit a strange blindness to reality; yet when the inferences that too many thinkers have drawn from them are considered, one sees that one's admissions must be carefully safeguarded. It does not follow that a community has a 'universal mind,' except in a metaphorical or Pickwickian sense

¹ Also upon the line of British idealistic philosophers from T. H. Green onwards.

² The following paragraph is quoted from a chapter contributed by the author to *Educating for Democracy*, edited by J. L. Cohen and R. M. W. Travers (Macmillan, 1939).

of the term; the only minds that actually exist are the minds of the individual citizens. It does not follow that the whole function of the individual is to serve the interests or add to the glory of the great Leviathan, the alleged communal Person. Philosophers or politicians who argue in these senses allow themselves to be misled by a dangerous and pernicious inversion of values: they value the mould above the thing moulded; they speak as if the gold existed for the sake of the guinea-stamp and not the stamp for the sake of making the gold a guinea. The instinct behind the democratic idea rejects this attitude. It recognizes (of course) that national traditions and institutions have a permanence that makes the individual life seem a trivial thing. It recognizes that those are often noble and august and that this is only too often, as Hobbes's phrase runs, poor, nasty, and brutish as well as short. Yet it feels that national traditions and institutions are important only because they help to fashion desirable patterns of individual life, and refuses to lose its sense of reality in face of their impressive grandeur. The instinct that points this way is, one must believe, a sound one; and if it is sound there is no doubt about the educational canon that follows from it. We must hold that a scheme of education is ultimately to be valued by its success in fostering the highest degrees of individual excellence of which those submitted to it are capable.¹

Such a doctrine we seek to set out in these pages and to make the basis of a stable educational policy. We shall stand throughout on the position that nothing good enters into the human world except in and through the free activities of individual men and women, and that educational practice must be shaped to accord with that truth. This view does not deny or minimize the responsibilities of a man to his fellows; for the individual life can develop only in terms of its own nature, and that is social as truly as it is 'self-regarding.' Nor does it deny the value of tradition and discipline or exclude the influences of religion. But it does deny the reality of any super-personal entity of which the single life, taken by itself, is but an insignificant element. It reaffirms the infinite

¹ The reader may consider whether this statement does not indicate the good at which all economic social and political reform and progress should aim. Cf. Sir F. Clarke, *Essays in Politics of Education* (1923), p. 67.

value of the individual person ; it reasserts his ultimate responsibility for his own destiny ; and it accepts all the practical corollaries that assertion implies.

Returning to an earlier remark, we may state the position in another way. While every man tends to draw his ideal of life largely from the inspiration of others, yet it may be maintained that, in a perfectly good sense of the words, each must have his own unique ideal. It is the sense in which every work of art—for instance, every poem—has its own ideal. A poet who recognizes that his creative impulse has failed would never point to another poem and say, ‘That is what I intended to do.’ His ideal was concrete, and to be embodied, if at all, in *his* poem and in no other. It marks the perfect achievement from which *his* work has fallen short ; not a goal that another has or might have reached. It follows that there can be no universal aim of education if that aim is to include the assertion of any particular ideal of life ; for there are as many ideals as there are persons. Educational efforts must, it would seem, be limited to securing for every one the conditions under which individuality is most completely developed—that is to enabling him to make his original contribution to the variegated whole of human life as full and as truly characteristic as his nature permits ; the form of the contribution being left to the individual as something which each must, in living and by living, forge out for himself.

We shall have to inquire shortly whether this view is supported by the facts of human development—that is, whether it is based upon the solid ground of nature or only upon an amiable illusion. That will be our task in the following chapters. Meanwhile it may be useful to indicate some of its consequences and to discount some misconceptions to which it is liable.

Our doctrine, as stated crudely above, may seem to permit no discrimination between good and bad ideals of life—between forms of individuality that ought to be encouraged and forms that ought to be suppressed. Is the schoolmaster, it may be asked, to foster with impartial sympathy the making of any character, regardless of its moral worth ? Common sense, a sound if not always a clear-headed guide, says ‘No,’ but it is not easy to expand and justify that answer without anticipating what will be found in later chapters.

One thing, however, is obvious: namely, that a child cannot at birth be charged with the self-responsibility which he may ultimately claim and must ultimately bear. Family and school are institutions whose existence implies a joint responsibility in which parents and teachers have a share—preponderating at first, then decreasing as the years pass and the lines of the child's individuality form and harden. In the moral sphere the main duty of parents and teachers is to see that the little world in which the child grows up is as rich as may be in those elements that go to the fashioning of the better types of individuality, and that other elements are excluded. Since we here admit a judgment—and it will often be a faulty and mistaken judgment—which is not the child's own, we are, of course, limiting the abstract freedom of his self-creative growth. But such limitations are part of the inevitable conditions of life. An architect can build only with the materials placed at his disposal, but is yet free to make what use of them his genius suggests. Similarly the studies and discipline of a school, while of necessity representing those cultural and moral traditions which authority deems to be of vital value, should yet leave abundant room for the free development of individuality. It takes all sorts to make a world, and the world becomes richer the better each becomes after his own kind. Even where the moral law is positive and not merely permissive, obedience may take forms endless and incalculable: thus a motorist, it has been said, best shows his love for his neighbour by keeping (in Britain!) to the left of the road. The point need not be laboured. It is manifest that there is no limit to the number of life-patterns into which good or blameless actions may be woven, and that it is impossible to formulate in advance the concrete principle of excellence of any of them.

We may go further, and say that the prudent teacher will take care not to multiply his prohibitions beyond necessity. Few things are more difficult than to foresee whether a new type of individuality, a new mode of expression in thought or action, will ultimately add to or detract from the real riches of the world. It is fatally easy to condemn as contrary to beauty, truth, or goodness what merely runs counter to our conservative prejudices. We know how often in the past men have sought to suppress the creative activity whose fruits have later been seen to be among mankind's greatest treasures.

We need to remind ourselves—teachers, perhaps, more than laymen—that these ‘old, unhappy, far-off things’ are constantly being repeated and paralleled, now in trivial instances, now in matters of serious importance. The most modern, the most striking and quite the most important instance is the long-obstructed rise of women from their Victorian subjection to their recent amazing achievements of equality and fellowship with men. A survey of movements during the last two generations in art, music, science, politics, education and moral ideas would yield many other instructive instances. A teacher will do well, then, always to have in mind the warning of Gamaliel and to beware lest haply he should be found to fight against God. In particular, he must be careful, in teaching social duties, not to seek to confine his pupils to the purview of an outworn text. Social obligations can be discharged in an infinite number of ways, and none can foresee or set bounds to what the human spirit may do in this as in the other fields of its activity. A daring and powerful soul may raise the whole moral quality of the social structure by asserting an individuality that may at first seem hostile to its very existence. And the unheroic soul, too, will best serve society by becoming most fully and truly himself. In short, the claims of society upon its members are best satisfied, not when each is made as like his fellows as possible, but when, in Bosanquet’s language, ‘he values himself as the inheritor of the gifts and surroundings that are focused in him, and which it is his business to raise to their highest power.’

The reader may have noticed that we have so far not raised the question whether society (or, to be precise, the State) may not at times of crisis demand services that entail the supersession, even the final sacrifice, of individual development, and whether an affirmative answer would not greatly weaken the general force of our argument. We might reply that for numberless men during the last two terrible wars such a sacrifice was actually the heroic consummation of self-fulfilment; but that reply, although true, is (in the memorable words of Nurse Cavell) ‘not enough.’ We must take firmly the line that mankind is not condemned for ever to endure its present evils; if there is a will to escape from them, its nobler spirits will certainly find a way. But if it is lawful to dream of a world in which the good of all would be much more nearly the

good of each than it is at present, it is lawful to do whatever may help to make the dream reality. What, then, could education do better than to strengthen men's sense of the worth of individuality, teaching them to esteem the individual life, not, indeed, as a private possession, but as the only means by which real value can enter the world? Here, it may be claimed, is the strongest bulwark of freedom and the firmest guarantee against the rule of violence.

Some who are satisfied that the intentions of our doctrine are good may yet doubt whether they are practicable. Does it not require, if not a separate school, at least a separate curriculum for every pupil? Here again we insist that we do not seek to change the unchangeable conditions of human existence, but merely to make the best use of them. Individuality develops only in a social atmosphere where it can feed on common interests and common activities. What G. K. Chesterton said about the artist is, in fact, true of every man: 'His attitude to his age is his individuality; men are never individual when alone.'¹ All we demand is that individuality shall have free scope, within the common life, to grow in its own way, and that it shall not be warped from its ideal bent by alien forces. Under such conditions some boys and girls will show themselves to be by nature secluded and cloistral spirits, and it is to the general interest that they should have licence to be so. But the crowd and the hero have such potent influence that few are likely in their development to wander far from the established types. In short, individuality is by no means the same thing as eccentricity. Teachers are not called upon to manufacture it deliberately, but merely to let it grow unimpeded out of the materials of each child's nature, fashioned by whatever forces, strong or weak, that nature may include.

It is the common boast of Englishmen that throughout their history they have clung stubbornly to individual liberty and have refused to exchange it for any more specious but delusive good. The worst charge that can be brought against them is that in refusing equal liberty to others they have sometimes sinned against the light that is in them. Upon what basis does that historic claim to liberty rest if not upon the truth, seen darkly by some, by others clearly envisaged, that freedom for each to conduct life's adventure in his

¹ *The Victorian Age in Literature* (Home Univ. Libr.), p. 10.

own way and to make the best he can of it is the one universal ideal sanctioned by nature and approved by reason ; and that the beckoning gleams of other ideals are but broken lights from this ? That freedom is, in truth, the condition, if not the source, of all the higher goods. Apart from it duty has no meaning, self-sacrifice no value, authority no sanction. It offers the one sure foundation for a brotherhood of nations, the only basis upon which men can join together to build the city of God. Dare we, then, take a lower, and can we find a higher, ideal to be our inspiration and guide in education ?

. . . The high goal of our great endeavour
is spiritual attainment, individual worth,
at all costs to be sought and at all cost pursued,
to be won at all cost and at all cost assured.

R. BRIDGES, *The Testament of Beauty*, II, 204-7.

NOTES ON BOOKS, ETC.

Sir JOHN ADAMS, *The Evolution of Educational Theory* (Macmillan, 1912), gives the most comprehensive review of the subject. Sir J. E. ADAMSON, *The Individual and the Environment* (Longmans, 1921), is an admirable defence and exposition of the ideal of individuality in education written from a more definitely philosophical standpoint than the present work. Two volumes in the Home University Library (Williams and Norgate) give, with bibliographical references, a clear account of the movements associated in the text with Hobbes and Hegel ; G. P. GOOCH, *Political Thought from Bacon to Halifax*, and E. BARKER, *Political Thought from Spencer to To-day*. The Hegelian position is brilliantly criticized in L. T. HOBHOUSE, *The Meta-physical Theory of the State* (Allen & Unwin, 1918). It receives a more friendly treatment in MUIRHEAD and HETHERINGTON, *Social Purpose* (Allen & Unwin, 1918). J. N. FIGGIS, *Churches in the Modern State* (Longmans, 1914), following the German scholar Gierke and F. W. Maitland, illustrates clearly the dependence of individual life upon social groups. R. M. MACIVER, *Community* (Macmillan, 3rd Ed., 1924), is a standard work on the subject. K. MANNHEIM, *Man and Society* (Kegan Paul, 1940) is an acute (though not always easy) sociological analysis of contemporary history. *The Year Book of Education*, 1936 (planned by Lord EUSTACE PERCY and published by Evans Bros. in association with the Institute of Education) contains, among many articles, a comprehensive review of educational thought in the form of essays by Sir F. CLARKE, F. A. CAVENAGH, C. W. VALENTINE, I. L. KANDEL and others.

CHAPTER II

Life and Individuality

The central notion of the last chapter may be compressed into an aphorism : Individuality is the ideal of Life. To call it an ideal implies that it is at once a goal of effort and a standard by which the success of the effort may be judged ; also that it is something that may be approached indefinitely yet never reached. What is, then, its precise character ?

To answer that question it will be helpful to develop further the comparison (p. 13) between a man's life and a work of art. For every one will agree, on the one hand, that individuality is in some sense the goal and standard of æsthetic creation, and, on the other hand, that the individuality of a poem, a sonata, a picture, a statue, is a partial expression of the artist's individuality as a man. It is not difficult, therefore, to see that the creative activity of art shows, in a peculiarly concentrated and energetic form, characters that actually belong to life in *all* its modes of expression.

The more prominent of those characters are easily recognized. In the first place, the artist strives to express through his materials a single scheme, in which the elements, however diverse in nature, have each its place, not accidental or irrelevant, but necessary and meaningful. He succeeds in so far as he can impose upon them this "unity in diversity" ; he fails in so far as they break from his control. In the second place, æsthetic creation is autonomous. This does not mean that a poet is independent of grammar and logic, that a musician need not regard the natural properties of chords and progressions, or a painter the form and structure of his model. But it does mean that there is no *external* law determining beforehand the use he may make of these things. Eighteenth-century critics censured the 'incorrectness' of Shakespeare, but a wiser generation recognizes that the plays have a logic of their own which can be judged only by its results. Similarly, an inventor must, of course, take account of the properties of his materials and the laws of physics, but no one can prescribe the use he is to make of

them. To do so would be to invent the machine before it is invented.¹

To speak of individuality as the ideal of life implies, then, that life as a whole is autonomous and that it constantly strives after unity. Upon the first point we have already said enough in the preceding chapter; we need add only that autonomy, as defined above, is the essence of man's 'freedom' as a self-determining agent. The statement that man's will is free, if understood as a claim that he can escape from the laws of his own nature, is ridiculous; but it is sound sense when understood as extending to the whole of life the obvious truth that it is impossible to invent a machine before it is invented or to compose a sonata before it is composed.

The second point could be illustrated in a thousand ways from every phase of human life. Unity in diversity is, for instance, the clear mark of all purposive actions, from (say) the skilled handling of knife and fork in eating a chop to the world-wide operations of a Napoleon of finance. Again, it is the mark of all knowledge, from the power to 'perceive' objects and events, such as tables and chairs and the movements of taxi-cabs,² to the power to understand the behaviour of a planet or a system of metaphysics. This unity, whether shown in action or in understanding, is always a partial expression of the individual's unity, and is felt by him as a pulse of the energy which is the very stuff of his life. And that it extends, potentially, to the whole of life is shown by the fascination of any well-told biography in which the writer brings out the unity which his subject's life strove after, and shows where and how it was broken and frustrated. Needless to say, the art of the novel and the drama draws largely from the same source of interest.

We have undertaken (p. 13) to seek a scientific basis for this view of life, and must now proceed to fix the general lines of our inquiry. But before we can do so, a very difficult question must be faced and answered. What we have said about individuality has been applied, so far, only to man's conscious nature or 'mind'; but reflection will

¹ Cf. Bosanquet, *The Principle of Individuality and Value*, p. 331.

² Whenever, for example, I recognize an object as a chair, a great number of very different former experiences contribute to the present experience and help to give it its character.

show that it can be said with equal truth about his body, and, indeed, about the bodies of all animals and even about plants. For, from the first division of the fertilized egg, bodily growth suggests everywhere the unfolding of a unitary plan, or the concerted action of individuals who thoroughly understand one another and have devoted themselves to a common purpose.¹ Thus the history of the bodily organs may be likened to the parts of a piece of polyphonic music wherein each pursues its own melodic course, yet takes account all the time of the other parts and of the musical whole they are conspiring to realize. And in growing to its final form the body seems to show only in a less degree than the mind the same quality of self-determination.² It seems clear, then, that whatever explanation we give of the broad facts of life must apply, in principle, equally to body and to mind. Hence the question: Are we, since our bodies are 'matter,' to seek in physical laws an explanation for the whole of life; or are we, since our bodies are alive, to interpret their activities by what we know of life where its character appears in the highest and clearest form—namely, in the conscious life of the mind?

The urgency of the question lies in the fact that men of science, and particularly physiologists, generally seek to interpret the life of the body entirely in terms of facts and notions derived from physics and chemistry. This tendency (or prejudice) is natural. The ultimate elements of the body are the familiar chemical elements, carbon, hydrogen, nitrogen, and the rest, combined in forms which can often be reproduced in the laboratory; the water of the body is ordinary water³ and behaves as such; the oxygen we breathe does the usual work of oxygen, breaking down compounds and setting free heat; the net heat-value of food consumed is precisely equal to the heat-value of the mechanical work the body performs, just as it is in the steam-engine or petrol-motor. Immersed in

¹ Cf. 'Die Pflanze bildet Zellen, nicht die Zelle bildet Pflanzen' (De Bary). 'Each part acts as if it *knew* what the other parts are doing' (Nägeli). (Quoted by T. H. Morgan.)

² We have, in fact, borrowed the term 'autonomy' from the biologist Hans Driesch, who applies it in this sense to the facts of morphogenesis.

³ It is even maintained that the aqueous solution which forms the basis of the blood-plasma has the composition of the ancient seas wherein life probably began.

discoveries of this order, and seeing their number daily increased, it is not surprising that physiologists come to think of the body as nothing but an exceedingly complicated physico-chemical machine. Theirs is, in fact, essentially the view of Descartes which made so much stir in the seventeenth century—namely, that man might be regarded as only a very cunningly fashioned automaton if we did not know from inner experience that he has a soul.

Descartes did not shrink—at least in theory—from the deduction that where, as in the case of other animals, direct knowledge of a soul is impossible, we need not suppose the creature to be anything more than a *bête-machine*. Thus (he would have said) the cry uttered by a beaten dog is an event essentially of the same order as the emission of sound by a bell, and no logic compels us to ascribe it to pain. No modern biologists would go so far as that, at least where the higher animals are concerned; but their scruples necessarily bring them face to face with an awkward dilemma. Either mental facts belong to a distinct province of being whose connection with physiological facts must be for ever inscrutable, or else they, too, are reducible somehow to facts of physics and chemistry.

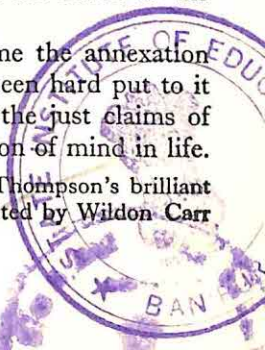
Most advocates of the 'mechanistic conception of life' elect, prudently, if unheroically, the former course;¹ but there are bolder spirits who do not shrink from the latter. Of these Jacques Loeb, who died after this book first appeared, was the most thorough-going and daring representative. His experiments on artificial fertilization, on the artificially directed growth of animals, and on the 'tropistic' factors in instinct, are undoubtedly most impressive. They gave him the hope—perhaps we must not call it a pious hope—that a physico-chemical explanation will be found in time for all the 'wishes and hopes, efforts and struggles, . . . disappointments and sufferings' that form 'the contents of life from the cradle to the bier.'

Meanwhile, psychologists, who do not welcome the annexation of mental facts by physics and chemistry, have been hard put to it to formulate a view which shall at once satisfy the just claims of those sciences and preserve the prerogative position of mind in life.

¹ For a statement of this position see Sir D'Arcy Thompson's brilliant article in the volume *Finite Life and Individuality*, edited by Wildon Carr (Williams and Norgate, 1919).

30.7.93

769



For Descartes sundered body and mind so effectively that he was himself unable, except by a most unconvincing *tour de force*, to bring them together again; and he left the problem practically insoluble for his successors. Most of them have been driven, therefore, to a position which answers almost completely to that of the less intransigent mechanists. In brief, they treat the mind, or, rather, 'experience,' as if it were a self-contained field of events and causation which has some inscrutable connection with bodily events, but plays no part in determining them. To hold this view—in the form called the 'doctrine of psycho-physical parallelism'—has long been, and perhaps still is, orthodoxy in psychology.

But the labours of an increasing company of workers seem to promise an end to this unhappy divorce between the sciences of body and of mind. We may take the work of H. S. Jennings of Pennsylvania University as typical of them. This writer, like most of his school, directed his studies chiefly to the behaviour of the lower organisms. Here, if anywhere, it should be possible to analyse life into chemical and physical reactions, and Jennings's earlier researches were definitely guided by the mechanistic conception.¹

But after long familiarity with the ways of these lowly creatures he was forced to the conclusion that physics and chemistry are insufficient to explain even the simplest forms of animal life. The animal's life is, of course, permeated (as human physiology is) by chemical and physical factors; but just as a poem, though permeated by grammar, is more than a sum of grammatical expressions, so the behaviour, even of a protozoan, escapes beyond the conception of a physico-chemical machine. In short, the humblest creature is autonomous.

The facts that converted Jennings to this view may be illustrated by some of his observations on the stentor—a single-celled, trumpet-shaped infusorian that dwells in marshy pools, attached to a water-plant or bit of débris, surrounds the lower end of its body by a translucent tube into which it can withdraw at need, and lives by agitating the cilia round the disc that (nearly) closes its trumpet and so whipping up vortices which carry food-particles into its mouth.

¹ This phase of his work is represented by the citations in the first chapter of C. Lloyd Morgan's *Animal Behaviour*.

When a stream of water containing carmine impinges against its disc, the stentor will at first drive the particles in the usual way into its mouth, but very soon begins to twist on its stalk and bend its trumpet away from the intrusive cloud. If several repetitions of this movement do not relieve it from the presence of the irritant, another reaction is tried; the ciliary movement is suddenly reversed, so that the particles are now thrown off the disc. If this manœuvre also fails, the animal contracts into its tube, remains there for about half a minute, then again emerges, unfolds its disc, and begins once more to move its cilia in the normal direction. A most interesting question now arises. The original conditions being restored, will the original sequence of reactions be repeated? The answer is definitely, No. As soon as the carmine reaches it, the stentor at once withdraws into its tube for a while, and continues to do so, remaining for a longer period each time, as often as, on re-emerging, it receives the particles upon its disc. Finally, it forces itself free from its attachment by violent contractions, quits its tube, and swims away to resume the business of life elsewhere.

In describing these 'reactions' it is difficult to avoid using terms one would employ without risk of censure in speaking of the analogous behaviour of a higher animal, such as a dog or a man. One is almost irresistibly tempted to say that this minute creature, after trying in vain all the minor devices at its disposal for getting rid of an annoying intrusion, adopts in despair the last resort of flight from an intolerable situation. In fact, viewed from without, the behaviour of the infusorian and the behaviour of the mammal would seem to differ only in details, not at all in principle. And this impression has become the more firmly established in the minds of many cautious and highly experienced observers the more they have studied the ways of these lowly creatures. Thus Jennings suggests that if the *amœba*—a tiny speck of living slime, without limbs or organs or even a definite form—were large enough to come within men's ordinary ken, they would regard it as 'controlled by the same elemental impulses as higher beasts of prey.' Moreover, he subscribes to the opinion, expressed by Raymond Pearl with regard to rather higher animals (the planaria), that 'it is almost an absolute necessity that one should become familiar, or perhaps better, intimate with an organism, so that he knows it in somewhat the same way that

he knows a person, before he can get even an approximation of the truth regarding its behaviour.'

These biological studies give one a lively sense of a solidarity in nature running through the whole gamut of animal existence. They teach us that all animals, from the amœba upwards, are centres of energy, in constant dynamical relations with the world, yet confronting it in a characteristic attitude of independence. Each one in its own way 'does trade with time and has commerce with circumstance,' shaping its course in accordance with its nature and its powers, and developing in its traffic with its world an individuality, rudimentary or complex, whose ways cannot be foreseen unless one knows it 'in somewhat the same way that he knows a person.' In short, stupendous as the distance is between the lives of the protozoan and the creature who has been made a little lower than the angels, it consists—like the difference between a village church and a cathedral—not in any radical unlikeness of the essential features, but rather in the differing richness, variety and subtlety of the details in which a single scheme has been worked out at different evolutionary levels.¹

But while we emphasize the fundamental identity of all animal life, we must not fail to appreciate the enormous differences in the degree of perfection that life achieves at its widely sundered levels. On the lower levels the animal's intercourse with the world is narrowly limited in range. Even when, as in the sea-anemone, definite 'receptors,' that is, specially sensitive cells, are developed in the creature's surface, commerce with the environment is mediated at first only by direct contact or chemical action. At a higher level 'distance receptors' are added, that is, cells sensitive to such agencies as light and sound. Transactions of a vastly greater range and complexity now become possible, and with them a much higher degree of individuality. Finally we reach in man a being who can

¹ For the sake of clarity nothing is said here about the complications described by Julian Huxley in an article 'What is individuality?' in *The Realist* for April, 1929 (Macmillan & Co.). The writer dwells upon the existence of colonial groups of animals, such as the coral polyps, and communities of higher order, such as the ants, where the group or community, rather than the single creature, fulfils the definition of individuality. Huxley's facts, though striking and important, do not seem to affect the upshot of our argument.

shape his course by reference to the impalpable and invisible objects of the intellect, can look before and after, and must nourish his life with spiritual as well as material realities. How far down the scale of being receptors are, in the proper sense of the term, sense-organs, it is impossible to say. Judging from what we know of the lower strata of our own organism, we may well suppose their activity in such creatures as the stentor to be utterly unconscious. But somewhere in the phylogenetic history the stimulation of receptors must have begun to be the occasion of a 'dim sentience' which was to develop in time into man's clear awareness of an ordered world about him. And in whatever guise consciousness thus emerged, we must believe that it came, not as a superfluity, or as something disconnected with what went before, but as a means of widening and enriching the sphere of vital activities—a means of raising individuality, so to speak, to still higher powers.

Upon this view man is not to be conceived as Descartes conceived him—namely, as an automaton *plus* a soul, or, as Epictetus put it, 'a ghost bearing up a corpse.'¹ He is, through and through, a single organism, a 'body-mind,' the latest term of an evolutionary process in which living substance has developed ever higher and more subtle functions. This view is as remote as possible from materialism; for though it invites the physiologist to push as far as he can his physico-chemical analysis, it refuses to regard perception and thought, feeling and will, as superfluous additions to a machine that would be complete without them. It preserves to the psychical all that ethics and religion require. It spiritualizes the body; it does not materialize the soul.

To sum up the discussion: Of the alternative ways of interpreting life (p. 20), the second is emphatically the one to be followed. Starting from the position that there is more than physics and chemistry even in the humblest animal, it comes to view the history of life as a striving towards the individuality which is expressed most clearly and richly in man's conscious nature, and finds, therefore, in that goal the true interpretation of its earlier efforts.

From that view two important consequences immediately follow. One is that the criterion of educational effort laid down provisionally

¹ Ψυχάριον εἰ βαστάζον νεκρόν, ὡς Ἐπίκτητος, ἔλεγεν. Marcus Aurelius V, 41.

in the first chapter is justified by a sound reading of biological facts ; for the education that aims at fostering individuality is the only education 'according to nature.' The other is that to limit the idea of individuality to the things of the mind is to take far too narrow a view of its scope. Individuality is an affair of the whole organism or 'body-mind.' The process we see shaping itself in the mind of a boy or girl is only the highest aspect of a process that actually involves the whole being, and includes movements that go back to pre-human days and even to the dateless beginnings of life.

Of the writers who, with clear awareness of its import, have taken the line of thought indicated above, one of the first and most notable was Samuel Butler, the author of *Erewhon*, who upheld it as a criticism of what he regarded, perhaps with imperfect justice, as the mechanistic heresy of Charles Darwin. Butler argued, for instance, that the facts of habit, of physical growth, of physiological functioning, of instinct, of heredity, can be understood only if we regard them as a group of phenomena whose typical character is expressed most clearly in memory—most clearly there, because in memory we are directly conscious that the past is reasserting itself in the present. Following the principle that the less well known should be explained in terms of the better known, Butler boldly maintained that they should all be ascribed to the operation of 'unconscious memory.' Similarly he suggested that the emergence in history of such a limb as the crab's claw can be understood only if regarded as due to an unconscious factor entirely homologous with conscious human invention ; the pincers which the carpenter uses for the same kind of purpose being, in fact, only a detachable limb, just as the claw is a permanently attached tool.

Butler's whimsical and malicious genius always prompted him so to phrase his arguments as to shake men most rudely out of their dogmatic slumber. Even the reader whose mind has been prepared by the preceding pages may be startled by the thought that the father of all crabs 'invented' his pincer-claws and that his descendants continue to grow them because they 'remember' that their forefathers have always done so. But the shock is much reduced when one realizes that Butler merely chose a vivid way of declaring that, widely as growth differs from memory and organic variation from invention, the kinship between the processes is yet

more significant than their difference. Nevertheless the phrases 'unconscious invention' and 'unconscious memory' contain a contradiction which makes his statements seem grossly paradoxical. It will be useful, therefore, to substitute for them terms which may be employed to do justice to Butler's facts without awaking divergent associations.

In the first place, then, we need a name for the fundamental property expressed in the incessant adjustments and adventures that make up the tissue of life. We are directly aware of that property in our conscious activities as an element of 'drive,' 'urge,' or felt tendency towards an end. Psychologists call it *conation* and give the name *conative process* to any train of conscious activity which is dominated by such a drive and receives from it the characters of unity in diversity and what Bosanquet called 'coherent adaptiveness and progressiveness.' For instance, the reader's endeavour to understand the present sentence is a conative process in which a relatively complex system of mental acts moves towards a more or less clearly envisaged end.

Now, although the behaviour of the stentor described on pp. 22-3 is essentially of the same character as this, we must hesitate to ascribe it to conation, for we have no good reason to suppose that the creature is *conscious* either of the carmine or of the end to which his movements are directed. And it is here important to observe that even reading, unquestionably a conative process, involves movements and adjustments of the eyes which, being unconscious, cannot be ascribed to conation, though they have the same general character as conative processes. For the reader's eye does not, like his spectacles, function merely as an optical instrument; its behaviour is the purposive behaviour of a living organ which enjoys, within the empire of the organism, a certain measure of responsible autonomy. Moreover, while the reader's mind is pursuing the printed argument, his neuro-muscular mechanisms are keeping his head aloft upon his shoulders, his digestive glands are dealing with his latest meal, his phagocytes are, perhaps, wrestling quietly with an invasion of the virus of influenza. None of these purposive processes may be called conative, for they lie below, and even far below, the conscious level; yet a supra-human spectator, who could watch our mental behaviour in the same direct way as we can

observe physical events, would see them all as instances of the same class, variant in detail but alike (as we have said) in general plan. In other words, he would see that they all differ from purely mechanical processes by the presence of an internal 'drive,' and differ from one another only in the material in which the drive works and the character of the ends towards which it is directed.

To this element of drive or urge, whether it occurs in the conscious life of men and the higher animals, or in the unconscious activities of their bodies and the (presumably) unconscious behaviour of lower animals, we propose to give a single name—*hormé* (*ὁρμή*).¹ In accordance with this proposal all the purposive processes of the organism are hormic processes, conative processes being the subclass whose members have the special mark of being conscious.

Similarly we shall bring together under a common designation all the varied phenomena referred by Butler to memory, conscious or unconscious. Following the German biologist Richard Semon, we shall speak of such phenomena as *mnemic* and shall give the name *mnemé* (*μνήμη*) to the character of living things which they exemplify. Memory, then, is conscious mneme just as conation is conscious horme.

In the task of analysing in outline the development of the human individual the concepts of horme and mneme will be our constant guides. It will be well, therefore, to begin our investigation with a somewhat fuller inquiry into the nature and the forms assumed by these fundamental aspects of vital activities. That inquiry will occupy us in the next three chapters. Before proceeding to it, however, it may be instructive to consider briefly a recent movement in psychology which settles the vexed question of the place of consciousness in life by denying (in effect) that it has any. This new psychology, which ignores what is generally held to be the subject-

¹ The use of this Greek word was suggested (but apparently not adopted) by C. G. Jung as 'an energetic expression for psychological values.' (*Analytic Psychology*, Eng. trans., 1916, p. 348, footnote. See also McDougall, *An Outline of Abnormal Psychology*, 1926, p. 27.) As is stated in the text, the use of the term is here extended to embrace (and to unify) the conceptions of purposive energy as manifested both in conscious and in unconscious behaviour. Thus it is wider than the use proposed by Jung and narrower than Bergson's 'élan vital.'

matter of the science, is called 'behaviourism.' Its chief exponent, J. B. Watson, argues that the so-called facts of consciousness, if they exist, are private facts, accessible only to the person who claims to 'experience' them. But a science cannot be built upon private facts; it must be based upon public facts, verifiable by anyone who can bring to their observation the requisite means and training. Hence if 'consciousness' were all we had to go upon, there could be no science of psychology. But this is far from being the case. I cannot enter into my dog's consciousness, yet I do not hesitate to make psychological statements about him, as when I say he knows that I am about to take him for a walk. Nor do I, as a rule, have to wait until a man declares his state of mind to me before I know that he is angry or impatient to catch a train. Indeed it often happens that we are more inclined to believe what we infer from a man's behaviour than what he tells us about his wishes and intentions; 'actions speak louder than words,' and self-ignorance and self-deception are common human weaknesses. The interpretation of observed behaviour is, then, our only means of psychological knowledge in the case of animals, and a method which common sense constantly uses in the study of man. Behaviourism simply seeks to make this method scientific, by applying it in a regular and systematic way to the analysis of all those features of human life which are called mental.

As an instance of the method we may take one of Watson's studies of the emotion fear.¹ He found by experiment that Albert B., a babe aged eleven months, showed the signs of fear only when he heard a loud sound or when the support beneath him was suddenly removed. He showed no fear of a white rat but strove to handle it when it was brought near him. But after the rat had, on several occasions, been presented to Albert at the same time as a steel rod was struck with a hammer, the fear awakened by the noise spread to the sight of the rat: the animal, once a strong attraction, became now, by itself, a cause of fear. The explanation given is that the fear, attached originally only to the sound, became first a response to the whole situation 'sound *plus* rat,' and could then be aroused by the second factor—the rat—acting alone. In technical language,

¹ Quoted from the abstract reproduced in Sandiford, *Educational Psychology*, pp. 169-72.

Albert's emotional response to the rat had become *conditioned* by association with the noise (see below, p. 44). Later it was found that other furry things, *e.g.*, a rabbit and a seal coat, also brought out the fear-response.

The reader may agree that such experiments may throw much light upon the early mental growth of children, and yet doubt whether behaviourism can deal with such things as thought, whose essence, it would seem, is to be 'private' and to exist only in consciousness. Watson would reply that psychologists have made a complete mystery of thought by separating it from muscular activity. It is not extravagant to say that a clever craftsman or tennis-player thinks with his limbs; a mathematician, working at an algebraic problem, could hardly carry on his thought apart from the motions of his pen and the symbols they trace; and the rest of us, if we paid careful attention to our thoughts, would find that they are embodied either in speech or in that silent version of speech which goes on 'inside the head.' Thus it is possible to regard thought, in so far as it is distinguished from intelligent bodily activity of the grosser sort, as only a subtle, highly organized activity of the speech organs, and so to bring its analysis within the compass of the behaviourist hypothesis.

With Bertrand Russell¹ we must admit that 'it is humiliating to find how terribly adequate this hypothesis turns out to be'—that is, how far one may go in the analysis of behaviour without assuming that consciousness plays any part in it. One may, of course, take the view—as Watson appears to do—that what we call consciousness just *is* behaviour; but that view, however courageous, must strike most people as extremely difficult if not indeed preposterous metaphysics. And if consciousness is not merely a name for certain complex modes of behaviour, but is something which may accompany them, then, as William James once argued, it is inconceivable that it should have 'nothing to do with a business which it so faithfully attends.'²

¹ *The Analysis of Mind*, p. 27.

² *Principles of Psychology* (1891), Vol. I, p. 136. For if so, he says, we could not understand why it should seem to be richer and more intense in a man than in an oyster, or why 'the most noxious acts, such as burning, might not give thrills of delight, and the most necessary ones, such as breathing, cause agony.'

While, then, behaviourism, by its insistence upon the solidarity and continuity between the lower and the higher functions of the organism, gives strong and welcome support to the position taken up in these pages, we cannot go all the way that Watson's radicalism would take us. We must still believe that the terms *perception*, *feeling*, *knowledge* and some others of their kind are the names of things which, though they are doubtless conditioned by bodily activity, yet play their own essential parts in the drama of human life.

NOTES ON BOOKS, ETC.

B. BOSANQUET, *The Principle of Individuality and Value* and *The Value and Destiny of the Individual* (Macmillan, 1912, 1913), contain a masterly treatment of individuality from the neo-Hegelian standpoint. J. LOEB, *The Mechanistic Conception of Life* (Cambridge Univ. Pr., 1912). H. S. JENNINGS's views are quoted from his *Behaviour of Lower Organisms* (Macmillan, 1906). HANS DRIESCH's views are summarized in *The Problem of Individuality* (Macmillan, 1914). SAMUEL BUTLER's doctrine is set out in his *Life and Habit* and *Unconscious Memory* (Fifield, new ed., 1910), and has been reasserted in A. D. DARBISHIRE, *An Introduction to a Biology* (Cassell, 1917). J. B. WATSON, *Psychology from the Standpoint of a Behaviorist* (Lippincott, 1919), is the Bible of behaviourism. PETER SANDIFORD, *Foundations of Educational Psychology* (Longmans, 1928), applies behaviourism in an instructive way to educational problems. J. A. THOMSON, *Secrets of Animal Life* (Melrose, 1919), contains several charming essays bearing upon the subject of this chapter. L. T. HOGBEN, *Principles of Animal Biology* (Christophers, 1930), is an excellent text-book of a novel type with a strong mechanistic bias.



CHAPTER III

The Will to Live

Horme, as we have defined the term, is the essence of the activities that differentiate the living animal from dead matter and, therefore, of what we have described as the animal's characteristic attitude of independence towards its world. The sense in which 'independence' is used here needs elucidation. No creature is independent of its world in the sense that it could exist apart from it; prevented from assimilating matter from the environment in the form of food, it would soon cease to live. We may go further, and admit that the intimacy of the relations between a living organism and its environment is, as J. S. Haldane pointed out, one of the main differences between it and a mere machine. Matter from the environment is constantly flowing into and out of the organism, being, in Haldane's vigorous phrase, only for a while 'caught up in the whirl' of its bodily structure. And the same is true of an organism's psychical activities; they could neither develop nor be sustained unless it were in constant intercourse with the world about it. For instance, a great part of a man's psychical activity evidently depends upon intercourse with his fellows and would perish if he were isolated. Thus it may be said that the texture of man's mind, like that of his body, consists in what is from time to time 'caught up in the whirl' of its structure in perception, in thought, in all the acts involved in the common social life. Nevertheless, every animal, so long as it is alive, continues to affirm or assert itself over against the world of which, from another point of view, it is merely a part. Even the least 'assertive' of us must recognize that this attitude belongs to every moment of our conscious lives. In every act we say to our world, openly or implicitly, 'I am here and to be reckoned with; I go a way that is, so far as may be, my own way and not merely yours.' And our bodies say the same thing after their own manner. Throughout the whole range of life this attitude prevails, from the amoeba, in which it is but a bare, unconscious 'will to live,' to man,

who consciously claims a share in the moulding of his own destiny.¹

Speaking broadly, we may say that the self-affirmation or self-assertion of the organism in the face of its world is shown in activities of two types, conservative and creative. The distinction is easily apprehended. On the bodily level the marvellous complex of physiological activities that maintain life and health—the fine adjustment of blood-temperature, of respiration, the bio-chemistry of metabolism, the magical industry of hormones and vitamins—this is clearly to be called conservative. In contrast, the facts of growth are typical of the body's creative activities. Every animal, beginning as a single cell, gradually builds the matter caught up in the whirl of its life into a characteristic bodily form. The fact that this form is always based upon its ancestors' reminds us that here, as everywhere else, hormone and mneme work together, but should not blind us to the significance of growth as a genuinely creative process. Specially interesting in this connection is the 'regulation' that secures the development of the typical bodily form of an animal in spite of serious disturbances in the normal conditions of growth. We may refer here to the well-known experiments of Driesch on the sea-urchin. By pressing an egg between glass plates, Driesch compelled the embryo to develop for some time as a flat layer of cells instead of in the normal, roughly spherical, shape; nevertheless it grew, after the removal of the pressure, into a quite irreproachable sea-urchin. The experiments of T. H. Morgan and others on the regeneration of the lost parts of animals illustrate the same kind of regulation in another form.

Conservation on the mental level is subtler but no less real. It is shown in the sense of 'personal identity' which normally stays with us throughout the chances and changes of life, and whose loss is one of the most grievous of disasters. It is obvious also in our feelings of being at home in familiar occupations and in familiar social surroundings, in our attachments to old habits, old friends, old books, old beliefs and prejudices, and in the fact (which might

¹ What is here called self-assertion is the 'Selfhood' about which the poet R. Bridges writes in Book II of *The Testament of Beauty*. Attentive reading will discover parallelism in many places between the argument of that great poem and the views developed prosaically in these pages.

well seem surprising) that lives, to all appearance equally satisfying, can be lived under widely diverse conditions of fortune and circumstances.

A man who does not write novels or plays or verse, who does not compose music or invent machines or spin scientific theories, might resolutely deny that he is ever a creator; but facts would confute him. There are, for instance, the facts of speech. These, as a child learns them, represent a vast creative achievement of his people, developed through many centuries yet at one epoch relatively stable. Early in life the child picks up the established routines, and by endless repetition makes them his own. But his use of the idioms thus conserved and inherited cannot possibly be foreseen; even the dullest person must constantly make a novel use of them to express his needs and desires and feelings, to report what he and others have done or intend to do, and so on. All these are humble but veritable acts of creation. And he may even in time play an unconscious part in building up the private language used by some closely-knit professional fellowship, such as the Royal Air Force. What is true of speech may be applied, with the needed modifications, to other daily doings of the most undistinguished of us; in short, creative features constantly turn up in the midst of humdrum conservative activities. Conversely, there can be no act of creation entirely free from conservative elements. The mathematician can discover a new theorem only if he retains command of the multiplication table, science advances through the reshaping or extension of old hypotheses, the rebel in music or painting must, after all, carry forward in his novelties much more than he rejects. In short, conservation and creation are factors in all self-assertion, and one type of activity differs from another not in their presence or absence but in their relative predominance.

It is an old remark that conservative activities are the 'driving wheel' whose energy guarantees the stability of all human societies. To be convinced of this truth one need only consider the life (say) of a busy modern town: its regular time-table of uprising, of business, of school-going and church-going, of sport, entertainment, rest and gaiety; the stabilities made possible by the running of trains, trams and omnibuses to settled places at settled times; the police-regulation of traffic; and, through all, the incessant efforts of every

family to preserve its own 'standard of life.' All these arrangements and efforts would fail in their purpose if they did not square with a deeply rooted tendency which urges the ordinary citizen to cling to established and familiar things just because they *are* familiar and established.

Within the stable conservative framework creative activity also plays its part in the life of every society. It has not the impersonal character of the deeper strata of the conservative activities, but expresses individual talent, genius and restless appetite for self-assertion. To exhibit these qualities in a primitive society is, unless one is of the dictator breed, to run a dangerous risk; nevertheless it must sometimes have been done. No society is absolutely stagnant, but is from time to time urged forward by some great man and the daring comrades he attracts. Many prehistoric advances made in this way have had enormous value for mankind and mark definite stages in its progress: for instance, the domestication of useful plants and animals; the invention of the methods of winning and working metals; the first use of boats. In recent years advances along such lines as these have become almost riotous in their boldness, profusion and rapidity. The mark of all is that they constantly modify the conservative basis of social life and in time transform its visible character. Thus wireless telephony and aeroplanes, whose development many of us still alive have watched from the start with astonishment and sometimes with misgiving, have become for the latest generation commonplace things whose use is just part of the routine of civilized life. The history of poetry, the arts and the sciences—things that seem to break out as a pure efflorescence of creative power—shows, when examined, the same fusion of creation with conservation. Every age cherishes its own poetry and music, its own outlook in science and religion, and deserts them unwillingly; yet creative genius is always fermenting, always reshaping, extending, transforming what its own age has hitherto clung to with instinctive loyalty; and always its best inspired achievements become in time part of what we have called the conservative basis. These observations show that the distinction between creative and conservative activities must not be drawn too sharply. We know, for instance, that the vigour and efficiency of many languages is due largely to the originating genius of a few

great poets and prose writers, and it is a commonplace that scientific work, which appears to be disinterested creation, often turns out to have useful, that is conservative value. Conversely, it is obvious that great industrial and commercial undertakings, though undoubtedly conservative in their original impulse, succeed mainly because creative ideas have gone to their making.

In subsequent pages we shall examine the bearing of these observations upon the school curriculum and class-problems. Here it is enough to make two points. The first is that a school fails in its purpose unless it gives its pupils some understanding and appreciation of the conservative basis of their nation's life and of civilization as a whole, and fits them to play efficiently, intelligently and dutifully, some part in its maintenance. It must, accordingly, be on its guard against the tendency of every type of education to stiffen into a closed and static system and to be too little responsive to the changing needs of the social situation. The second point is that a school fails unless the spirit that pervades it gives its pupils a zest for at least some modest form of adventure in life and some confidence in their power to carry it through. Here the standing danger is that didactic and dogmatic methods of instruction should receive too large a place, too little room being left for freer methods of learning based upon a belief in the average pupil's gift of spontaneity and a due sense of the importance of developing it.

We have next to bring out an important feature which belongs to all hormic processes whether they are conservative or creative, and whether their seat is the body or the mind or (as is most usual) the 'body-mind.' This feature is their tendency to come together in such a way as to merge their separate identity in some hormic process of wider scope. Just as in an army or a Church there is a hierarchy of officers whose duties and powers are always, except in the highest, subordinate to those of a superior, so in the individual organism we constantly meet with hierarchies of hormic processes. Thus the reader's effort to understand the present sentence is subordinate to the ampler hormic process which aims at grasping the argument of the chapter, this to the still more complex process whose end is the mastery of the book. The hierarchy possibly extends much higher still; for mastery of the theory of education may be an incident in

the reader's training for his profession, and the training in turn subordinate to a prolonged hormic process which will end only with his retirement from teaching.

In this illustration each of the constituents of the hierarchy is, like the hierarchy as a whole, not only a hormic but also a conative process—that is, it is the expression of a conscious 'drive' towards a consciously pursued end. It is, however, by no means necessary that the constituents of a conative complex should themselves be conative. Let us suppose that a man, wishing to call on a distant friend, rides to his destination on a bicycle. The expedition as a whole is a conative process, and the act of cycling taken as a whole is also a conative process subordinate to the former. But the cycling involves a great multiplicity of movements of limbs and trunk, which are certainly not now conative processes, though they may have been so before the agent became an expert rider. Most of them are 'automatic' processes, originally distinct and autonomous, that, as the cyclist acquired mastery of his art, became organized into a hormic system working as a whole, and ready as a whole to serve the interests of any higher system that calls for its collaboration. And in the complicated behaviour of those deeper parts of the organism that subserve digestion and respiration we have instances of hormic systems of an elaborate kind, in whose organization and working consciousness plays as a rule no discernible part.

We are now in a position to interpret man's life as a history in which two main movements are to be distinguished. One is a development in the perfection (to use S. Alexander's term) of his hormic processes: a development which carries them from the merely physiological level through the level of unconscious, or only dimly sentient, animality to the level of conscious conation. The other is a complementary development in which they become organized into ever wider and more complex hormic systems. Beginning as a cell in his mother's body, a very part of her flesh, he shortly becomes a 'parasite' nourished by her blood and feeding on her food, yet already a being with a life and destiny of his own.¹ The hormic processes, both conservative and creative, in which that life consists, are still mainly unconscious, though, as his nervous

¹ The relation between mother and embryo is, perhaps, better described as 'symbiosis.'

system determines and his sense organs form, his 'will to live' may be enriched by some vague conational, that is conscious, elements, while he still lies in his mother's womb. As soon as he has left her body and has entered on the long task of picking his way through the labyrinth of the outer world, the conational elements acquire a new significance, and their development becomes the centre of the spectator's interest. Conation rises slowly from the level of blind or purblind impulse to that of clear-eyed desire, and eventually from the level of desire seeking an immediate good to that of will fixed upon a distant and perhaps ideal goal. Meanwhile, subserving this advance in the character of the hormone, there is a parallel development in its organization—showing itself first in the emergence of the physiological organs and in the correlation of their functions, then, after birth, in the co-ordination of the powers of sense and movement in systems of ever-increasing complexity and effectiveness, and lastly in the gradual building up of the great conative hierarchies that determine the form of the man's individuality and are the measure of his life's achievement.

The significance of this twofold development is, we repeat, itself twofold. On the one hand, it enables the growing child to face the world in more definite independence while entering into ever richer relations with it; on the other hand (and the former purpose is doubtless subordinate to this), it enables him to express himself in activities that have an ever-increasing value. Education is concerned with both these aspects of the child's development, but, as we have already said, especially with the latter. That is, for instance, the meaning of the familiar statement that the main task of teaching is to create and cultivate 'interests.' There should be no need in this day to protect that statement against a once too common misunderstanding. It means not that the school should be made a place of pleasant entertainment, but that it is a place where the child should be tempted to throw himself into the worthiest forms of activity, and where the hormic systems that function in those activities should be firmly established in his nature against the day when he will be called upon to use them and develop them further in the greater world beyond school.

If we regard a hormic process as an outflowing of energy of body or mind, then we may say that such outflowings always tend to clothe

themselves in significant forms or patterns. Suppose that as a walker is crossing a street the sound of a hooter gives warning that a motor-car is descending upon him. If he is imprudently buried in thought, the sudden noise may, for a moment, startle him: that is, it is not heard as announcing the approach of a car, and it does not prompt to any organized movements. But almost instantly the reaction becomes hormic; the energy of 'self-preservation' emerges and appears in a definite pattern which governs the development of the situation. That pattern is partly *cognitive*: that is to say, the walker becomes aware that his life is threatened by a car in a certain place moving rapidly in a certain direction; and it is also partly *active*: which means here that his bodily movements take a form that strives after safety. This tendency of our energies to disclose themselves in ever-developing forms or patterns is what is meant when life is said to be fundamentally creative. In creative activities (as they are described on p. 34) the pattern is the essential thing created. The function of conservative activities is to protect and maintain the patterns, whether they are those revealed in instinct or those acquired during one's personal history or the history of one's community. In this way knowledge in all its forms, invention, scientific discovery, craftsmanship, physical and athletic skill and achievement, and everything that falls under the august names of truth, beauty and goodness have come into the human world.

Two more points must here be dealt with briefly to prepare the way for later discussions. The first is that as hormic processes become organized into systems, their forms or patterns become not only more complex but also more *expressive*. The italicized term¹ can best be explained by examples. A good picture of a landscape has more expressiveness than the landscape itself, a better picture of it more expressiveness than one less good. Keats's ode to the nightingale is more expressive than the song of the bird, or than the emotions and thoughts it awakened in the poet before his creative labour began. The play of a trained cricketer is more expressive than the undisciplined smiting of the village batsman. In the same sense of the word, a child's interests and other forms of activity become, as they develop naturally, more expressive than

¹ It is taken from Croce's theory of æsthetics.

the crude movements of mind and body from which they sprang. We return here to an idea we have already had before us : that the way of the artist shows in the clearest and most definite form what is fundamentally and ideally the way of all life. We draw and must constantly reinforce the corollary that the best way of education is the one in which this idea is most fruitfully applied.

Secondly, we must note that psychological investigations, conducted by the method called ' psycho-analysis,' have thrown a flood of light upon the whole question of hormic organization. They have shown, on the one hand, how large a part is played in our conscious behaviour by hormic factors of which we may be at the time utterly unconscious—that is, that our conative processes are rarely purely conative, but almost always embrace important components belonging to the lower strata of our bafflingly complex organism. On the other hand, they have illuminated in a striking way the continuity of our conative development, showing that the adult mind is, so to speak, but the visible surface of a living structure whose deeper layers are hormic elements dating from infancy or even beyond, and liable in certain circumstances still to break free from the systems into which they have become merged and to claim unfettered expression. But these are matters that had best be dealt with in the inquiry into the forms of mneme to which we now turn.

NOTES ON BOOKS, ETC.

J. S. HALDANE, *Organism and Environment as illustrated by the Physiology of Breathing* (Oxford Univ. Pr., 1917). Also *The New Physiology* (Griffin, 1919). Haldane has treated the same subjects from a philosophical standpoint in *The Sciences and Philosophy* (Hodder & Stoughton, 1928). The standard book on interest is Sir JOHN ADAMS's *The Herbartian Psychology Applied to Education* (Heath & Co.); the subject is also pleasantly treated in J. WELTON, *The Psychology of Education* (Macmillan, 1911).

CHAPTER IV

*The Living Past*¹

In the conscious life of man mneme is most clearly manifested in memory. In memory my own past still lives in me; and not only my own, but also the past of men who died ages before my birth. And through the social memory we call history the past is incessantly shaping the present actions of men. There are, however, in our conscious life many instances of mnemonic activity where the term 'memory' cannot be applied without an inconveniently wide extension of its proper meaning. It would, for example, be a little violent to say that the reader 'remembers' what words the several groups of letters in this sentence represent, or that he 'remembers' what the words mean. And he would certainly not tell an intimate friend, encountered in the street, that he 'remembers' his face. Nor would he say that the expert pianist 'remembers' where to place his fingers as he plays a piece of music at sight. In all these cases memory once played its part, but that has long been superseded as the basis of action. The agent now reacts immediately upon the stimulus without any conscious reference to past experience; he 'reads' the print, he 'recognizes' or simply 'sees' his friend, he plays the runs and chords 'automatically.' When we extend our consideration to lower animals, the need of a wider notion than memory proper becomes still more evident. Horses and dogs, for example, learn a great deal both from instruction and from experience, but it is unlikely that conscious memory plays more than a very subordinate part in their education. And when we descend to the level of such creatures as the stentor the invocation of memory is quite out of the question. Yet, as we saw on pp. 22-23, the stentor, in its encounter with the stream of carmine, certainly behaved as if it remembered at one stage of the contest what had happened at previous stages. It is abundantly clear, then, that we need, merely to describe the overt behaviour of man and other animals, a term, such as mneme, which shall bear

¹ This title is taken from F. S. Marvin's well-known book.

to memory in the proper sense the same relation as hormone bears to conation—that is, a term referring to a general property of living organisms, of which conscious memory is only a special and occasional manifestation.

In inquiring more closely how mneme operates, we may conveniently begin with an example drawn from the interesting pages of the biologist from whom the word has been borrowed. A young dog, happily ignorant as yet of human baseness, greets with friendly barking a gang of boys, who respond by pelting him with stones. Hurt and terrified, the puppy runs home, and for months or even years afterwards bolts with tail between legs at the sight of man or boy bending suddenly to the ground.

To understand such a sequence of events it is clear that we must in the first place credit the dog with certain tendencies and capacities: the capacity to 'perceive' and the tendency to be 'interested in' the doings of a group of noisy young human beings, the tendency to bark half joyously and half defiantly at their clatter, the capacity to single out or discriminate from the mass of their movements such acts as stooping and throwing, the capacity to feel pain and terror when the skin is violently struck, the tendency to flee when these feelings are powerfully evoked. These capacities and tendencies, together with a multitude of others, are the conditions which determine the way in which the puppy will react to the various situations he encounters. Using a convenient term of the psychologists, we may call their sum-total the animal's 'disposition'; and, since the point of the story we are analysing is that dispositions change as the result of experience, we may distinguish the initial sum-total from the form it subsequently assumes, by naming it, in reference to what is to follow, the dog's 'primary disposition.'¹ There is no evidence that the dog, when once safely home, ever remembers or thinks about his misadventure, yet we find that if, long afterwards, a stranger should, in his presence, suddenly stoop to pick up an object from the ground, or to adjust a shoe-lace, the animal may bolt incontinently from the spot, just as if he had not only perceived the movement, but had also received a blow from a missile. It is evident, therefore, that his 'primary disposition' has suffered a change to a 'secondary disposition,'

¹ Semon's term is 'primärer Indifferenzzustand.'

which only awaited the appropriate occasion to be revealed in a novel form of reaction. The question is how we are to conceive of the change. The obvious reply is that the dog's experience has left traces, or as Semon terms them, 'engrams' ('imprints') upon the primary disposition, and that the change is due to these. But if we are to understand the matter thoroughly the reply must go farther than this. We must suppose not only that, on the day of trouble, the perception of stone-throwing, the feeling of a blow, and the experience of flight urged by pain and terror were for the first time brought together in the dog's history, but that he somehow *experienced* these things as *belonging together*. Of his capacity to experience such things as 'belonging together' we can say only that it is a special case of the organism's general power to create unity in diversity, or to give form to its experiences (*cf.* p. 19). We must, however, further suppose that, as the correlative of that capacity, the several engrams which correspond to the several items of the original 'excitement-complex'—*i.e.*, the perception of stooping, the pain, the feelings of terrified flight and the rest—do not simply lie side by side in the animal's disposition, but are deposited therein as an organized 'engram-complex,' forming henceforward part of the structure of his secondary disposition and having a definite though subordinate unity of its own. And it is the result of this organization that, when one of the original excitements recurs—namely, the perception of a boy or a man stooping to the ground—the engram-complex as a whole is reawakened into activity, and the animal behaves as if the whole of the original situation were reconstituted.¹

It seems possible to interpret in terms of engram-complexes phenomena of 'learning by experience' and of 'coherent progressiveness and adaptiveness' that occur in a myriad forms in the behaviour of animals from the lowest up to man. It is important to realize how varied, as well as numerous, those forms may be. In the first place, it is by no means necessary that the stimuli which give rise to an engram-complex should be simultaneous; they are

¹ We do not, with Semon, assume that engrams are actual modifications of the protoplasm. For us engram-complexes are what J. T. MacCurdy (p. 212) describes as 'patterns' governing the emergence and sequence of bodily and mental phenomena, but we do not inquire into their physical basis.

at least as often successive. The power to recite a poem or to play from memory a piece of music implies an engram-complex of the latter kind, so organized that each word or chord, when uttered or played, brings about the repetition of the next and of the subsequent words or chords. The same thing must be true of habitual actions, such as dressing and undressing, unlocking familiar doors, and the like, and of the acquired ways and tricks of domestic and wild animals; in none of which does conscious memory play a conspicuous part, even if it is present at all.¹

In the second place, the components of an engram-complex may be derived from widely different strata of the organism's nature. An experiment by the physiologist Pavlov illustrates effectively this important principle. Pavlov made a strict point of giving a dog food exactly two minutes after ringing a bell. When the dog was habituated to this procedure, he occasionally rang the bell without offering food or allowing it to be seen. Nevertheless, saliva was on these occasions copiously secreted in the animal's mouth precisely two minutes after the accustomed signal. The physiologist cannot tell us in detail what happens during such a period of two minutes; but it is clearly to be regarded as the unfolding of an engram-complex which, though it includes in its scheme widely diverse functions, conscious and unconscious, is yet capable of being 'released' by the action of a single stimulus—the sound of the bell.²

The student will find no difficulty in applying similar explanations to numerous phenomena of daily occurrence—such as the physiological rhythms connected with the digestive functions, and with sleep. It is more interesting still to see how they may be

¹ How little does conscious memory help when by a sudden lapse (which may be quite innocent) one has lost hold, for once, of the familiar trick of tying one's cravat!

² The secretion of the saliva as an automatic response to the sound of the bell is called a 'conditioned reflex.' Compare the 'conditioned emotional response' of the infant Albert to a furry object (p. 30).

Here is an undesigned experiment which may be compared with Pavlov's. In a certain residential college scrambled eggs were regularly served for breakfast on Thursdays. Accordingly, when for once this dish appeared at Wednesday's breakfast, many students went to their class-rooms armed with the books needed at the first lecture on Thursday!

invoked to illuminate the mysteries of growth and inheritance. To understand these—so far as understanding is at present possible—we must, in the first place, grasp the fact that the fertilized germ-cell is not something that precedes the organism, but is the organism itself in its earliest stage. We are then ready to think of it as possessing a disposition—the ‘primary’ disposition of the organism in a special sense—which is already charged with engrams derived from the life of its ancestors. From this point of view the physical growth of a creature from germ-cell to the adult form is seen as a process entirely homologous with the recitation of a poem or the playing of a musical composition from memory. Apart from the circumstance (in a sense accidental) that reciting and playing are conscious while growth is unconscious, the only substantial difference between the two kinds of process lies in the fact that the mnemonic basis of the former was acquired during the life of the individual, while bodily growth reveals an engram-complex established far back in the individual’s ancestry. We must suppose that the stimulus which provokes the first division of the ovum into two cells acts on the inherited complex in much the same way as the opening words of the poem or notes of the music act upon the acquired complex. Thus each engram in the series announces in due course its presence in the disposition until at length the whole of the ancient scheme of development is once more reasserted.

We may see the same mnemonic principle at work in the instincts of animals—and here conscious as well as unconscious acts are involved in the reaffirmation of the inherited rhythm. As an illustration we take one of Semon’s examples: the nest-building instinct in birds. Nest-building is, of course, the expression of an ‘urge’ subsidiary to the hormic process whose end is the procreation and nurture of the next generation. That great hormic process is initiated, in all animals above the lowest, by definite changes in the structure and functioning of the reproductive organs—changes that are themselves incidents in the mnemonic rhythm of life. At a certain stage in its development, the sight of the proper kind of materials acts as a stimulus, releasing a marvellously complex train of activities that ends only with the completion of a nest, often of a highly elaborate and characteristic pattern. The mated birds behave, in fact, as though they remembered and sought deliberately

to reproduce a structural plan firmly established in the tradition of their race.

Man shows no such unmistakable instances of racial mneme on the conscious as well as on the merely bodily level; nevertheless, unprejudiced observation finds sufficiently clear traces of it running everywhere through the tissue of his life. It is a trite remark that 'as soon as a wife becomes a mother her whole thought and feeling, her whole being, is altered,' and no one shrinks from referring her behaviour, even in its highest spiritual manifestations, to 'maternal instinct,' that is to racial mneme, as its basis. Many writers have ascribed a mnemonic origin to certain characteristics of mythology and folklore that are found among men of all races, and appear in varied but allied forms at all periods of history. It is even suggested with some plausibility that certain common features of our dreams may be, so to speak, revivals of the waking thoughts of our remote forefathers; that they are racial reminiscences which, excluded from waking consciousness by the conditions of modern life, assert their continued existence by weaving themselves into the visions of the night.

It is more germane to our purpose to note that the same notion of racial mneme is the basis of a theory which, though it is sometimes pressed to extravagant lengths, is not without some validity as an educational principle. That is the theory that the mental development of the individual 'recapitulates' the mental history of the race. Stanley Hall, a leading exponent of the view, exemplifies it when he bids us see in our little civilized barbarians between the ages of eight and twelve, with their stable bodily form and obstinate good health, and their curious passion for independent life, a clear reaffirmation of a pigmoid stage in human evolution, which still has representatives in the Bushmen and the little people of the Congo forests. In the same spirit Carveth Read, an eminently cautious thinker, finds 'recapitulation,' not only in the way in which the speech of children, like that of the infra-human hunting pack from which he assumes mankind to be derived, 'emerges from emotional noises and impulsive babbling, assisted by gesture,' and in their early awakened appetite for private property, but also in the passion which from about the sixth year is directed towards the building of 'houses,' showing a strong family likeness to the tree-shelters of

anthropoid apes, and towards the making of primitive tools. He even suggests that by observation of children we may effect a tentative reconstruction of the lost series of events which made up the early history of man's emergence from the beast, and of his long struggle towards the possession of language, customs, myths, reasoning power and humane sentiments.¹ Other psychologists are more cautious. For instance, G. H. Thomson writes: ² 'There seems to be no doubt that boys do have the Boy Scout instincts strongly developed. And that is about all that direct observation shows in favour of the Recapitulation Theory.'

Before closing this chapter it is proper to make a brief reference to views, supported by the authority of eminent names, which make a radical distinction among the mnemonic phenomena we have tried to reduce to a single principle. Henri Bergson maintains that there is a fundamental difference between 'true memory' and 'mechanical association'; and Wildon Carr illustrates the distinction by the difference between an auditor's memory of the performance of a piece of music and the motor mechanisms which enable the pianist to play it. William McDougall contrasts, for the same purpose, the ease and perfection with which his child of six recalled past scenes and events and the slowness and difficulty with which the same child learned to name the letters of the alphabet. Bergson and McDougall do not explain these differences in the same way, but their interpretations agree in spirit. According to both, mechanical association is an affair of the body, chiefly of the nervous system, while true memory is an activity of a spiritual force or entity that *uses* the bodily mechanism for its purposes. In short, mechanical association belongs to the 'corpse,' true memory to the 'ghost' in the corpse.

It is clear that Bergson and McDougall have surrendered to the mechanists as far as the body is concerned, and seek to redress the situation by invoking the mysterious aid of a *deus in machina*. Unless they are also prepared, and they are not, to accept the Cartesian paradox that all animals but men are soulless, they must

¹ See his article in the *British Journal of Psychology*, Vol. VIII, Pt. 4, June, 1917.

² *Instinct, Intelligence and Character* (1924), p. 77.

either refer the phenomena of 'true memory' (including in McDougall's case the very numerous phenomena called 'recognition of meaning') to the operation of a spiritual world entity which uses all animal bodies as its instruments of expression, or suppose each *machina* in which they appear to have its own *deus*. It is roughly just, if summary, to say that Bergson adopts the former alternative, McDougall the second. The doctrine sketched in this chapter suggests an interpretation of the facts more acceptable, perhaps, than either of these. C. W. Valentine, upon whose storehouse of observations, patiently made and accurately recorded through a total period of twenty years, we shall often draw, noted that as early as the second fortnight after birth his child B. 'gazes long and earnestly at [the] face of any one talking to him,' and that (on the tenth day) 'he showed great interest not only by gazing steadily but also by becoming motionless when I contorted my face.'¹ The infant's interest was at first in faces as such, and did not develop into certain recognition of a particular face until the sixth or seventh month. Valentine is sure that at that age all of his five children recognized him.

Now a face is a complicated object whose details, though they engross us at all ages, are not really very impressive or prominent in themselves. Apprehension of such an object is a feat of which a recently born baby would be incapable if nature had not prepared him for it—that is, if there were not an inherited engram-complex at the back of it. Using Plato's celebrated term, one might say that the infant's ready grasp of the facial pattern is a sign of *anamnesis* (*ἀνάμνησις*) or reminiscence—not indeed reminiscence of the child's own prenatal experience, as Plato might hold, but of ancestral experience somehow registered in the germinal cells from which the child sprang. This anamnesis helps him greatly to grasp, in due time, those variants of the universal pattern that distinguish one face from another.

Anamnesis may also explain the young child's power of recalling scenes and events; for such things have for ages played their part in human and prehuman experience, and the basal organization needed to give them form and meaning has become part of our

¹ *The Psychology of Early Childhood* (Univ. of London Press, 1942), pp. 72, 81. In later pages this book is referred to as Valentine.

inherited disposition. In mechanical association anamnesis has no place, and the connections to be remembered have to be built up laboriously by constant repetition. But where movements have a mnemonic basis, as walking, running and dancing doubtless have, learning comes as easily as the recollection of faces and events.¹

NOTES ON BOOKS, ETC.

The references to SEMON are drawn from his book, *Die Mneme als erhaltendes Prinzip* (Leipzig, Engelmann, 3rd ed., 1911; p. 420). The book is analysed and criticized by MARCUS M. HARTOG, *Problems of Life and Reproduction* (John Murray, 1913). L. P. PAVLOV, *Conditioned Reflexes* (Eng. trans., Oxford Univ. Press, 1927), is the leading work on this subject. BERGSON's views on memory are set out in his *Matter and Memory*, especially Ch. 3, and expounded in WILDON CARR, *The Philosophy of Change* (Macmillan, 1914). McDougall's views are given in his *Body and Mind* (Methuen, 1911). For the laws of mechanical association see H. J. WATT, *The Economy and Training of Memory* (Ed. Arnold, 1909). The matters considered in this and in Chapter II are dealt with critically by BERTRAND RUSSELL, *The Analysis of Mind* (Allen & Unwin, 1921).

¹ In a famous passage of his *Principles of Psychology* (Vol. 2, p. 406) William James quotes the experiments of Spalding, who found that swallows, confined from birth in a small box, were able, when released after their wings were grown, to fly at once without any instruction or prompting from older birds. Thereupon James suggests that 'a scientific widower left alone with his offspring at the critical moment' should make it impossible, by 'a small blister on each sole,' for the child to be taught to walk, and predicts that after a suitable delay to allow his nerve-centres to ripen, he would walk as well as if he had been learning 'during all the blistered time.' Valentine did not carry out this nefarious experiment, but makes the very significant observation that, as early as the second day, one of his boys, when held with feet just touching the floor, performed quite regular walking movements. These were, however, soon discontinued, and emerged again as true walking at the beginning of the second year. (Valentine, pp. 122, 532.)

CHAPTER V

The Relations between Horme and Mneme

We have separated hormone and mneme for convenience of discussion, but it must always be remembered that the terms are only names for aspects of the organism's activities, and that the features to which they refer are, in historical fact, never separated. Every act of self-assertion is both hormic and mnemic: hormic in so far as it is an instance of the conservative or creative activity which is the essence of life, mnemic in so far as its form is at least partly shaped by the organism's individual or racial history. In other words, engram-complexes are not to be thought of as dead deposits in the organism, or as possible materials of which the organism's creative activity makes use, but are living parts of the disposition from which all the animal's activity flows; or, to put the same idea differently, are the vehicles in which the conservative and creative functions appear and are exercised.

This very important truth is involved in the familiar observation that progress in art and invention, in science and philosophy, in politics and social life, and (we may add) in morals and religion, is never an advance from something wholly discarded to something wholly new. The stepping-stones on which men and societies rise to higher things are never their *dead* selves, but their mnemic selves, alive and actively growing. The reader is advised, especially if he is a teacher, to gain as vivid an idea as possible of this activity of the 'living past' by studying it in the history of some important department of human progress.

He should also learn to recognize the omnipresence of the same principle in everyday activities. Take as an example the writing of a letter. It is obvious that the impulse to use this highly artificial mode of communication is mnemic, as well as the command of words and their meanings, of spelling, and of pen-movements, that is needed for its fulfilment. Moreover, the specific situation out of which the impulse—the hormone—arises must also be largely mnemic in character, for the writer's purpose must be to congratu-

ate, to apologize, to persuade, to express love or anger, or to perform some other act of a recognized type. This mnemonic mass is the matrix in which hormone stirs and out of which it emerges, taking definite shape and content as it proceeds. Thus the writer's confidence that he 'knows what he is going to say' does not imply that he knows beforehand what words he is about to set down. It is an excitement awakened by a situation which, though partly new, is also partly old—an excitement felt already to be spreading to the engrams (engrams of ideas, words, turns of expression, and so forth), whose activities must be drawn into its sphere if it is to be an adequate vehicle of self-assertion in face of the novel as well as the familiar elements of that situation. The same general account may evidently be given of the genesis of a poem, of a piece of music, or of the solution of any theoretical or practical problem.¹ Nor does it hold good only of elaborate activities such as these; it is equally true (for example) of every act of verbal expression that goes beyond the bare repetition of a conventional formula. Thus any conversation that is more than a mere exchange of commonplaces has necessarily an element of adventure; for no speaker who has once embarked upon a sentence can foresee precisely where it will carry him. All that can be said with certainty is: (i) that the utterance must originate in the excitement, at once hormic and mnemonic, of some specific complex; (ii) that this complex governs its course from beginning to end;² and (iii) that the complex does not remain unchanged during the utterance, but is modified and enriched by the products of its own creative activity in such a way that it often

¹ '[The poet] does not know till he has said it either what he wants to say or how he shall say it. The imaginative experience supposed to be in his mind does not exist there. What does exist is the subject which detains him and fixes his thoughts and images and passions and gives his excitement a colour and direction which would be different with a different subject matter. Excitement caused and detained by this subject . . . bubbles over into words or the movements of the brush or chisel. When the artist has achieved his product he knows from seeing it or hearing it what the purpose of his artistic effort was.' (S. Alexander, *Beauty and other Forms of Value*, p. 59.)

² The plight of the nervous public speaker who 'loses the thread of his sentence' is due, of course, to a failure of the engram-complex to retain its command of the activity.

becomes a substantially new thing, fitted to be the starting-point of a fresh movement of self-assertion.

This directive influence of the engram-complex is called by psychologists its 'determining tendency,' and has been studied experimentally in simple cases. Let the reader utter or exhibit to another person (the 'subject') a word chosen at random, having previously instructed the subject to reply with the first word that comes into his mind. In this case—technically known as the case of 'free association'—it is impossible to foresee what kind of 'reaction' the 'stimulus-word' will provoke, for the mental movement is at liberty to take any one of an indefinite number of possible directions. But now let the experimenter announce that the stimulus-word will be the name of a class, and that the reaction is to be the name of some specimen of that class; then the result will be quite different. For the association that supplies the reaction is no longer 'free'; it is 'constrained'—that is, guided by a definite 'determining tendency.' If, for instance, the stimulus-word is 'animal,' the reaction will be some such word as 'dog'; if 'coin,' some such word as 'penny,' and so on.

It is important to realize what happens here. The subject's memory does not throw up a number of suggestions from which a suitable reaction-word is consciously selected; it gives him immediately a word of the required character. Such a result cannot be explained, except on the assumption that the determining tendency is the hormic action of a complex whose excitement induces the activity only of engrams congruent with itself. We may, in fact, regard these experiments on constrained association as simplified models of what takes place in all originating activity, whether it be shown in thought, in invention and imagination, or in everyday phenomena of action and will.

The great mathematician, Henri Poincaré, has given striking illustrations of this statement in his accounts of the way in which he reached some of his famous discoveries.¹ Upon the basis of these and similar documents, Graham Wallas² worked out an 'art of thought' which he urges students to follow deliberately and would have taught to pupils at school. The main principle of the

¹ *Science and Method* (Eng. trans., Nelson, 1914).

² *The Art of Thought* (Cape, 1926).

art lies in the recognition of four distinct stages in the history of any piece of constructive thinking. The first is the stage of Preparation, in which the problem is envisaged as clearly as possible and if need be analysed into its subdivisions. During this process promising suggestions may leap at once out of the depths of the mind, but in most cases success does not come so easily. One needs to 'sleep over' the problem, to 'turn it over in the mind.' In other words, time is needed for the elements of a solution to gather together under the architectural influence of the determining tendency—which in this case is the formulation of the problem, backed by the will to solve it.¹ The process—called by Wallas the stage of Incubation—may go on for a long while without a sign that anything is happening; but at last—often without warning and sometimes in most incongruous circumstances—the stage of Illumination arrives and the happy idea emerges from the unconscious. The final stage, that of Verification, takes place, like the original analysis of the problem, in the full light of consciousness. Its function is to pin the inspiration down to a clear and exact form and to test its validity.

A useful way of dealing with obstinate difficulties both in teaching and in learning may be noticed as a 'rider' upon Wallas's doctrine. A virtuous student is generally held to be one who 'hammers away' at a difficulty and refuses to go forward until he has overcome it; yet a less austere policy may often succeed better. For Wallas's psychology suggests—and experience gives ample proof—that a mathematical theorem one cannot understand or a passage in a foreign tongue that will not yield sense may often prove to be surprisingly tractable if one ceases to struggle with it, moves on to easier ground, and returns to the hard place a good deal later. One may then, in fact, find that the unmanageable theorem, the untranslatable passage, has become plainly intelligible and wonder why it ever gave so much trouble. 'Incubation,' during which the difficulties have straightened themselves out under the influence of later developments," explains the mystery.

¹ 'Some subconscious faculty was at work while he [Rufus Isaacs] slept and he would awake to find a complete set of facts, the proper arrangement of which had given him much thought on the previous night, neatly sorted and pigeon-holed in his mind on the following morning.' (*Rufus Isaacs* by his Son, 1943; p. 108.)

Akin to incubation is the way in which an engram-complex often becomes 'consolidated' during intervals of rest from the performance it underlies. A talent, Goethe told his friend Eckermann, advances and grows within the mind in the intervals between its exercise; and William James says, more picturesquely, 'we learn to swim in winter and to skate in summer.' The reader has, perhaps, himself observed instances in which skilled acts, not yet perfectly automatic, are performed better immediately after than they were before an interval of abstention from practice.¹

Some experiments by P. B. Ballard illustrate the same phenomenon in verbal memory. Ballard found that when a piece of poetry is learnt by heart, the amount available for recall, instead of being greatest immediately after the learning, may increase for several days—some words and phrases originally remembered being lost but replaced by a greater number that emerge after the interval. This 'reminiscence' is very notable in young children, but diminishes in amount as they grow older. In adults it appears to be almost negligible.²

Before passing on we must emphasize another aspect of the relations between *horme* and *mneme*. We all know that memory is apt to prove treacherous, not only in what it lets slide, but also in what it claims to retain. For instance, an exciting incident we may have witnessed is often strangely translated in our subsequent account of it. This is notably the case if we ourselves played in the events a part not so satisfactory as we might have wished; we are then apt, however innocently and unconsciously, to give them a form less hurtful to self-esteem.³ Children exhibit this familiar

¹ Such observations have an obvious bearing on teaching methods. It should, however, be added that Thorndike regards this doctrine as misleading. See Sandiford, *Educational Psychology* (1928 edition), p. 239.

² See Ballard, 'Reminiscence and Obliviscence,' Monograph Supplement of the *Brit. Journ. of Psych.*, No. 2, 1915.

³ 'I can picture vividly a certain passage in my own life which, I may add, was of a distinctly creditable kind. The discovery of a contemporary document not long ago proved to me that my motives had been materially different from what I had imagined—and decidedly less admirable. The authentic history which I supposed myself to remember was a pretty little romance which I had unconsciously composed by a judicious manipulation of partial impressions.' (Leslie Stephen, *Some Early Impressions*, 1924, p. 9.)

The present writer boasted that, as a child, he had broken a collar-bone,

tendency in a specially striking way, and are liable, as R. L. Stevenson has pointed out, to suffer unjust censure on account of it.

The facts of incubation and consolidation form a natural transition to the next point to be discussed. They suggest that a determining tendency, after it has ceased to occupy consciousness, may still pursue its work in the darkness of unconsciousness. This interpretation is strongly supported by the common observation, already referred to, that if we 'sleep over' a difficult problem, we often find the solution in our hands when we return to it in the morning. And every one must have noticed how frequently things that memory has sought in vain to recall may at a later moment 'saunter into the mind,' as James says, casually and irrelevantly, 'just as if they had never been sent for.'

Occurrences of this kind prompt the question whether association is ever really 'free,' and whether the 'accidental' emergence of thoughts and words into consciousness is not always due to the action of determining tendencies—that is, of engram-complexes—'working in the darkness.' That, in a great number of instances, this is the case was proved by the insight and patient labours of S. Freud of Vienna, Carl Jung of Zürich and their followers, whose discoveries have opened up a most important field—perhaps the most important—in modern psychology.

The reader must understand clearly what is the point at issue. It has long been a psychological commonplace that the course taken by thought and memory is normally¹ determined by certain 'laws of association.' The question raised by Freud and Jung concerns the nature of those laws. According to the older view, association is a purely mnemonic phenomenon, depending entirely upon such 'mechanical' factors as the frequency and recency of the connections in experience between the things associated. According to the newer view (which will be seen to be consonant with the ideas developed in this Book), it is essentially hormic as well as mnemonic.

until he discovered in middle life that he had filched the glory of this exploit from a younger brother!

¹ 'Normally,' because it has commonly been assumed, explicitly or implicitly, that in insanity and in the 'irrational' behaviour of neurotics, the ordinary laws of association in some mysterious way break down.

That is to say, the course of thought and memory is largely determined by *active* complexes, whose influence depends not so much upon whether they have been frequently or recently excited as upon the part they have played in the subject's *hormic* history. If a complex has been an important vehicle of self-assertion—and especially if its activity has been markedly pleasurable or unpleasant—it will insinuate its influence into the current of thoughts and memories as mysteriously and irresistibly as King Charles's head forced itself into Mr. Dick's memorial.¹

By examining a subject's reactions to a carefully chosen series of stimulus-words, a skilled experimenter can generally bring to light those engram-complexes in the subject's disposition which have or have had most significance for his self-assertion. Sometimes the complexes thus disclosed occasion the subject no surprise; sometimes, on the other hand, he has not the least idea of the degree to which they dominate his mental life—or even, of their existence. A striking literary instance of the self-revelation sometimes thus brought about by reaction to 'stimulus-words' is Emma Woodhouse's sudden discovery of her attitude towards Mr. Knightley, provoked by a critical conversation with her friend Harriet Smith.² The candid reader will probably confess to similar events, trivial or serious, in his own experience. 'Sudden conversions' and a host of analogous incidents are phenomena of essentially the same kind.

More important still than the positive influence of buried complexes is their negative influence in excluding ideas and recollections from consciousness. If a subject is flustered by a stimulus-word, or takes an unusually long time in reacting to it, it is generally safe to deduce that the word has impinged upon a complex whose conscious activity would be painful. The complex may lie on the 'fore-conscious' level—that is, the ideas belonging to its activity, though forgotten, may be capable of being recalled by the subject. But in other cases it may be buried so deep that only ruthless and long-continued analysis can bring it to light. In such cases it is always found to be derived from painful experiences or unpleasant

¹ This is not merely an analogue; it is rather an example of the action of a peculiarly insistent complex.

² Jane Austen, *Emma*, Ch. 47.

impressions deliberately expelled from the mind, or to be connected with directions of self-assertion from which the subject, in his development, has more or less violently broken away.

The phenomenon here in view is described by the technical term 'repression.' Ordinary forgetfulness is, without doubt, often due to repression—that is, to the fact that, unconsciously, one *wants* to forget.¹ The letter which I persistently forget to write, or, after I have written it, to post, is frequently a disagreeable one; the family to whom I have inexplicably omitted to send my usual Christmas greetings turns out to have a name similar to that of an intimate friend, recently lost; and so on. Chronic as well as occasional lapses of memory come under this explanation. It has been suggested,² for example, that inability to remember personal names may often be due to the circumstance that one's own name, being either odd or extremely common, is offensive to one's self-esteem. In other cases a less dramatic explanation may suffice. For instance, the author has more than once been in the humiliating position of meeting a former student whose personality and career were striking and well known to him, but whose name, in spite of much endeavour, he could not recall. He has found that in such cases recollection was blocked by a more recent student who happened to bear the same name. When *this* student was remembered the older claimant ceased to be nameless. It will be noticed that in both kinds of cases the trouble is due to a conflict between complexes—one struggling to reach the surface, the other actively repressing it. A host of blunders and mistakes—such as slips of tongue and pen, misprints, the mislaying of objects, false recognition of persons and things—may similarly be attributed to the influence of repressed complexes.

Two instances from the author's recent experience may be given to illustrate this statement—and to challenge the reader to discover similar instances of his own. (i) Having incautiously consulted a fashionable dentist, he received in due course a bill of distressingly large amount. This was put away in a drawer to await a more convenient season, but when the virtuous impulse to pay arose, had

¹ Ernest Jones boldly maintains that all forgetfulness is due to this cause. See his paper in *Brit. Journ. of Psych.*, Vol. VIII, Pt. I.

² By Ernest Jones, who, following his master, Freud, has written on the whole subject very brilliantly.

mysteriously disappeared. More than once afterwards the drawer was searched in vain, and the matter then dropped for a while from the victim's mind. At last shame drove him to ask for a duplicate of the account and to discharge it. And now, when time had healed the wound, the original bill turned up again in the drawer—so plainly there that it seemed incredible that it could ever have been overlooked! (ii) The author intended, in discussing the present theme with his students, to illustrate it by quoting the well-known lines in the *Merchant of Venice* (Act III, Sc. iii) where by a slip of the tongue ('One half of me is yours, the other half yours—Mine I should say.') Portia discloses her true attitude towards her suitor Bassanio. For that purpose he turned up the passage in the relevant volume of the Temple Shakespeare, but just as he was descending to the lecture-room dropped the book upon the floor. He picked it up in seemly silence, and hastily turned over the leaves to regain the lost place. As he did so there suddenly stood out from the mist of rapidly moving print, clear and black as if in leaded type, the words 'blinking idiot.' This astonishing experience provoked more than one remark. In the first place the words, regarded as a comment upon the author's clumsiness, were undeniably apt, yet in the second place they were not such as would be allowed to pass his academic lips. His 'unconscious' must certainly be responsible for the ribaldry. Curiosity then inquired what was the actual phrase of the poet which suppressed vexation had distorted into this piece of modern vulgarity; and here a further surprise was sprung upon the investigator. For he soon found—what he ought, of course, to have remembered—that 'blinking idiot' actually occurs in the Shakespearean text (Act II, Sc. ix)!

In the foregoing instances the buried complex exercises direct influence, positive or negative, upon thought or action. In other cases its influence may be disguised by the fact that it merges its activities in those of other complexes which have retained the right of admission to consciousness. The expression of the buried complex is in these cases not direct but *symbolic*. Oddities of manner, spasmodic grimaces, and queer habits (such as Dr. Johnson's tricks recorded by Boswell), often have their explanation here; meaningless in themselves, they may be shown by psycho-analysis to be perfectly intelligible as symbols by which some inarticulate

complex is striving to express itself. Thus an epidemic of breakages in the kitchen may symbolize the maid-servant's antipathy to a scolding mistress. The virtuous maid may be unaware of the depth of her resentment, and may seek, quite honestly, to 'rationalize' the 'accidents' by attributing them to the coldness of her hands or the hotness of the water or by invoking some other plausible excuse.

There are few of us whose daily thoughts and conduct do not offer to the psycho-analyst material of this character. And, as Freud has shown, there is one region of the mental life of every one where the symbolic activity of buried complexes is not an exceptional incident but an essential and universal feature—namely, the region occupied by dreams. Dreams, to use Maurice Nicoll's apt image,¹ are *cartoons*; and in them the skilled interpreter may often 'read strange matters.' That is why they are now so industriously studied by those whose business is to minister to minds diseased.

There is an interesting and important difference in the attitude of Freud and Jung towards dreams. According to Freud, a dream always harks back to repressed, and therefore unfulfilled desires of childhood. He holds, then, that its 'manifest content' must invariably be interpreted as the disguise assumed by a 'latent' infantile wish seeking symbolic satisfaction in the dream-phantasy. Jung accepts the distinction between the 'manifest' and the 'latent' content of dreams, and recognizes the influence of forgotten incidents of childhood. But for him the dream, though necessarily rooted in the past, is essentially a forward-directed activity. It embodies symbolically a protest or warning of the organism as a whole against the unhealthily restricted range or the dangerous course of its own conscious activities.² Both theories have, probably, their special spheres of usefulness, but the reader will observe that Jung's view brings the dream into line with the general doctrine of self-mainten-

¹ *Dream Psychology* (Oxford Univ. Press, 1917).

² This view is expounded at length in Nicoll's book and is illustrated, with special reference to education, in Dr. Constance Long's article in the *Journ. of Exper. Pedagogy* for June, 1917. T. W. Mitchell (*Problems in Psychopathology*, pp. 173 *et seq.*) states very clearly the differences which divide Jung from his master, Freud, and also how the second important 'heretic,' Alfred Adler, differs from both.

ance sketched in Chapter III and with what was said about the functions of engram-complexes earlier in the present chapter.

A case described by W. H. R. Rivers¹ illustrates very clearly the value of dreams in the diagnosis and treatment of mental troubles. The subject was an officer in the R.A.M.C. who was a victim to claustrophobia—that is, to an unreasoning dread of being in an enclosed space, especially if he could not escape from it. He had suffered from this painful fear since boyhood, but never discovered it to be abnormal until, on joining the Army in France, he observed that other men could live comfortably in the trenches and dug-outs in circumstances so intolerable to himself that his health completely broke down under them. When he came into Rivers's hands he was instructed to record his dreams and, in particular, to follow up the memories that came into his mind while thinking over them immediately on waking. In this way he eventually recovered the long-forgotten incident that was the origin of his trouble. It seems that, when three or four years of age, he had taken an article for sale to a rag and bone merchant, whose dwelling was reached by a long and dark passage, and that on returning with the halfpenny earned by his enterprise he found the door of the passage shut. He was too small to open it, and in the darkness a dog began to growl, causing him the extreme of terror.

The subsequent verification of some of the forgotten circumstances recalled in this dream showed beyond doubt that the engram-complex was here revealed whose subterranean activity had played so baleful a part in the patient's life. We need add to the story only one more item, but one of extreme importance. As soon as the origin of the patient's irrational terrors was disclosed they ceased to plague him. He was able for the first time to sit in a theatre and to travel in a tube railway train with comfort. Thus was illustrated one of the tenets of the Freudian doctrine—namely, that a repressed complex, when once the resistances which kept it submerged are broken down, generally loses its noxious power.²

¹ In *The Lancet* for August 18, 1917.

² Rivers at first hesitated to subscribe to this view, thinking it possible that the alleged 'cathartic' effect of psycho-analysis may really be due to suggestion; for the patient has been made to believe that when the complex is discovered he will be cured. He appears to have become later more

An account by Cyril Burt¹ of the dreams and day-dreams of a delinquent girl is still more instructive, both because it bears more directly upon educational questions and because Burt recorded the analysis in unusual detail. The story is of a pseudonymous 'Nellie Malone,' a somewhat backward and 'difficult' parlourmaid of sixteen, who, after earning the reputation of a disobedient and quarrelsome child at home and at school, got into serious trouble by repeated thefts of jewellery from her mistress. Burt relates two of her dreams. About these it must suffice here to say that the first was a typically absurd picture-story of an old cow, a nurse-maid and a kilted boy, of the falling out of the cow's eyes and of its death at the hands of the girl, who stabbed it to the heart with a chocolate éclair; while the second dream presented a thunderstorm and a horrible man who stole Nellie, and bore her away upon horse-back until a lightning stroke rolled them into a ditch. The important point is that by patiently confronting Nellie with these superficially ridiculous details, and following up the memories and associations they recalled to her, Burt was able to reconstruct enough of the girl's inner history to make her understand at least something of her own character and of the true significance of her pilferings. The main personages in that history, besides herself, were an adored but rascally father (the highwayman of the second dream); a mother who frequently punished her and awakened her jealous resentment—whom she had at least once called 'an old cow' and whose death she had openly desired; and an elder brother, now in a Highland regiment, upon whom her tenderness anchored when the father,

friendly to the orthodox view. It is more important to record Rivers's conviction that his experiences with shell-shocked soldiers definitely refute the Freudian dogma that all repressed complexes originate in infantile sexuality. The origin of Freud's belief is, he holds, to be found in the fact that the wide range of impulses covered by the term 'sexual' in the Freudian school are those which are most commonly suppressed in the conditions of peaceful civilized life. In war the soldier is called upon to suppress impulses belonging to an equally primitive and powerful set of tendencies—namely, those connected with fear. For the Freudian reply to this argument, see Mitchell, *Problems in Psychopathology*, p. 174.

¹ Given in *The Journal of Experimental Pedagogy* (Longmans) for March and June, 1921. In subsequent issues of the *Journal* the discussion is continued in order to bring out the parallelism between this girl's phantasies and an important type of fairy-tales and ancient myths.

having been divorced by his wife, disappeared and was given out as dead. Subsequently there came in Nellie's 'governess' at school and her employer ('Mrs. Badger'—note the provocative name!). These women Nellie's 'unconscious' identified, in turn, with her mother; for both were set over her and both had often to take her to task. Moreover, identification was helped by the facts that all three women wore pince-nez glasses ('Old Mother Four-Eyes!') and that the girls at school had spoken scornfully of the governess as 'an old cow.' Thus the way was made easy for Nellie's early attitude of rebellion to become fixed and to be extended to society at large; and her thefts were in part explicable as an expression of that attitude.

Nellie was a persistent day-dreamer, and a study of her favourite romance went far towards completing the explanation. The phantasy was of the continuous kind not unusual among the young, and though obviously fed by Nellie's voracious reading of novelettes, had its deeper sources in those natural reactions of the lonely and resentful child whose classical expression is the tale of Cinderella. In the day-dream the absent father became the descendant of Irish kings with vast estates in the land of his birth, the unsympathetic Mrs. Malone a mere stepmother; and Nellie learnt these facts from a young stranger who came upon her in Hadley Wood after an argument with her harsh mistress about a broken soup-plate, took her to London, fed her nobly and decked her with fine dresses and jewellery, and finally revealed himself as the Prince of Wales! The pilferings were means which Nellie took to 'give verisimilitude' to this 'otherwise unconvincing narrative.' The daughter of kings and the betrothed of a prince, was not the splendour of gold and pearls her due? So Mrs. Badger's finery, occasionally only 'borrowed,' but too often retained, served the double purpose of feeding starved self-love and of avenging the wrongs Nellie had suffered from mother, governess and mistress and the whole world which stood behind them in their acts of injustice.

Pragmatic persons to whom theft is merely the illegal appropriation of other persons' goods will read of these things with some impatience. It is, indeed, not to be maintained that they justify Nellie's misdeeds, but they certainly throw much light upon them. And if comprehension of the crime is important to the crude justice

which would protect society against a criminal, it is essential to the higher justice which seeks to save the criminal from himself. Burt does not claim that the self-revelation which came to Nellie through the analysis of her phantasies entirely reformed her character; but he records that her pilferings ceased. No reader of his and of kindred studies can, in fact, fail to be convinced of the immense value of inquiries into young delinquency which proceed from the assumption that bad upbringing and evil surroundings may leave dynamic traces not only in the conscious thoughts and memories of children, but also in deeper regions of their mental life, whence they exercise influences which are all the more baleful because they are beyond the victim's vision and comprehension.

There can be no doubt that the evidence summarized in this chapter both confirms and enriches the general view of the organism which we adopted at the outset. In particular it tends to correct common errors and prejudices with respect to the significance of consciousness in human behaviour. Consciousness is, as we have said, the form in which self-assertion, whether conservative or creative, reaches the highest level of perfection as yet exhibited in animate creatures. As such it has a significance and a value which it would be perverse to depreciate. Nevertheless, it is, from the biological standpoint, only one of the organism's means of conducting that intercourse with the environment by which and in which it lives. Consciousness marks the growing-point of our higher activities, the edge by which they 'cut into reality.' Behind this point, this edge, there is a vast hormic organization of which a great part is never represented directly in consciousness, while, of the residue, much that has once been conscious can never normally and in its own character reach the conscious level again. Nevertheless, the movements of consciousness, subserving the organism's perpetual self-assertion, are never wholly explicable apart from this organization, whose history and constitution they express in an infinite variety of subtle ways.

We have already referred (at the end of Chap. III) to the influence of early-formed complexes upon the ultimate fashion of a man's individuality. So far as this influence is expressed in 'habit' we need not discuss it; for William James has preached upon that

subject what has been called the finest psychological sermon in any language,¹ and we will not essay the hopeless task of improving on him. Research, particularly by the psycho-analysts, has, however, thrown into relief certain related phenomena, whose educational importance is so great that some consideration must be given to them.

These phenomena spring from the underground existence of strong infantile interests that have been repressed because they were judged to be unseemly or inconvenient. Such interests may persist in the unconscious and may become constant sources of misconduct, rebellion and unsatisfied desire unless the energy locked up in them can be transferred to the service of wider interests that are accepted and approved by adult opinion. This transference is called 'sublimation,' and is justly regarded by Freudian writers as a process deserving the careful attention of all who have to do with the upbringing of children. Sublimation, it should be understood, does not mean the mere shifting of a stream of general energy from one direction to another—as when a young man transfers to war or finance the energy he has hitherto wasted on 'the little emptiness of love.' It is the recomposition into a new hierarchy of definite hormic factors of which each has its share of energy and carries that energy with it into the worthier complex. The teacher who has the insight to detect the unsatisfied hormic factors beneath the surface of a child's or a youth's conscious life, and can contrive to draft them into worthy and satisfying modes of self-assertion, may often save for society a useful and vigorous individuality that would otherwise be lost. This is, we may remark, the secret of the success in reclaiming 'young delinquents' that was attained in the Little Commonwealth, whose superintendent, the late Homer Lane, traced with natural psychological insight the steps by which the uncompensated repression of natural impulses in childhood often leads to social outlawry in adult life.² The same tale is told, with equally broad sympathy and 'a much more exact

¹ It will be found in Ch. IV of the *Principles of Psychology* and in Ch. VIII. of *Talks to Teachers*.

² See, for example, his article on 'The Faults and Misdemeanours of Children' in the *Report of the Conference on New Ideals in Education* for 1915 (published by the Secretary, 24, Royal Avenue, Chelsea, S.W.).

scientific analysis, in the masterly studies of Cyril Burt.¹ It is, in fact, unquestionable that the records of psycho-analysis greatly strengthen the argument for making the autonomous development of the individual the central aim of education. They reveal in what dim depths the foundations of individuality are laid, how endlessly varied are its natural forms, and how disastrous it may sometimes be to force upon the growing character a form discordant with its principle of unity.²

If it be asked why this truth has so long been ignored and is still so rarely recognized, the answer is that, in ordinary cases, the sublimation of the rebellious or undesirable impulses of childhood takes place without difficulty under the normal conditions of home and school life. The child grows simply and easily into one of the stock patterns of humanity. Thus a teacher who watches with insight and tolerance the passage of a pupil through some 'awkward age' often enjoys the satisfaction of seeing him or her come out of it, perhaps even the better for the tumultuous experience.³ On the other hand, every school has its problems in the form of boys or girls who 'get across' their teachers or their fellows, and are obstinately unresponsive to instruction or in other ways out of touch with the influences of the school society. The short way of dealing with these divergents—the process called 'licking them into shape'—has rarely more than a superficial success and often produces lasting harm; for it touches only the symptoms, not the causes of the trouble. The causes are, more often than we suppose, deep-seated impulses which have not found healthy modes of expression, and, their cruder manifestations being necessarily suppressed, sometimes prompt the child to rebellious outbursts incomprehensible even to himself, sometimes make him unteachable or 'unclubable.' In extreme instances the effect of repressed and

¹ In his book, *The Young Delinquent* and elsewhere.

² The *British Journ. of Educ. Psych.* for Feb., June and Nov., 1942, contains a valuable study of sublimation by J. C. Flügel. The notion is subjected to keen criticism by C. Spearman in *Psychology Down the Ages* (Macmillan, 1937).

³ Valentine, p. 17, gives instances of difficult children who, being compelled to wait their turn at a Child Guidance Clinic (see p. 66), no longer needed treatment when the time came; they had been cured by 'maturation,' i.e., by the natural growth and ripening of nature.

unsublimated impulses may even be to isolate a child for all practical purposes from the life of his fellows. An instance of this kind has been described to the writer by a highly competent observer—namely, the case of an elementary school-girl who, at the age of thirteen, had learnt neither to read nor to write, and had never been known to speak voluntarily at school, but who, when removed to an environment where free expansion was permitted, revealed intellectual ability far above the average and rapidly developed strong and characteristic interests.¹

No period of youth escapes these disturbances of its peace, but they are especially likely to vex the early years of adolescence. New stirrings then arise that may easily conflict with older systems of impulses which still persist in 'the unconscious,' and so cause an inner discordance which only sublimation can resolve. The strongest part of the case for raising the legal limit for whole-time or part-time education is that, under the conditions of modern life, the schools, and they only, can provide for the great majority of our boys and girls the means by which that sublimation can be safely accomplished and the conflict of adolescence issue in a character at peace with itself and in full command of its potential forces.² For a school, if properly administered, on the one hand, opens fields of interest for the intellectual and æsthetic impulses that the conditions of industrial employment too often stifle and repress, and, on the other hand, provides a healthy social life to receive and give form to the energies which, in accordance with the inevitable law of human growth, are beginning to turn from their original objective, the home. The paucity of opportunities of this kind for the bulk of our young population has no doubt caused an immense loss of

¹ The 'Child Guidance Movement,' which originated in a systematic form in the United States of America, aims at setting up in large centres of population clinics where school teachers and parents may obtain expert advice upon the treatment of children who, though not delinquent in the technical sense, are yet in some way 'difficult,' liable to unintelligible fits of temper or misconduct, etc. A careful survey of home conditions and other relevant external facts is always undertaken in such cases; but the essential thing is a study of the effect of these upon the deeper as well as the more superficial layers of the children's minds.

² See Bompas Smith, 'Problems of the Urban Continuation School,' in the *Report of the Conference on New Ideals in Education* for 1917.

individual happiness and social wealth, and is largely responsible for the 'failure of civilization' which present-day moralists are wont to deplore.

NOTES ON BOOKS, ETC.

BERNARD HART's little book, *The Psychology of Insanity* (Cambridge Univ. Press, 1912), is a popular but sound introduction to the study of 'complexes,' written by a leading psychiatrist. (It should be noted that Dr. Hart applies the term 'complex,' as it is applied in this book, to *all* mnemonic structures of the type described above, pp. 43-5, while most writers limit it—in the present author's opinion, unfortunately—to *morbid* structures and those that cause 'irrational' behaviour.) Freud's doctrines have been developed in a long series of difficult books and memoirs. The student is therefore advised to begin with a general review such as ERNEST JONES's brilliant little *Psycho-Analysis* (Benn's Sixpenny Series, 1928). T. W. MITCHELL, *Problems in Psycho-Pathology* (Kegan Paul, 1927), is a lucid but much more thorough and critical review. E. JONES, *Papers on Psycho-Analysis* (Baillière, Tindall & Cox, 2nd ed., 1918), is less up to date, but is comprehensive and has much original value. For the two more important schools which have split off from Freud, see C. G. JUNG, *Collected Papers on Analytical Psychology* (Eng. trans., Baillière, Tindall & Cox, 1916), and E. WEXBERG, *Individual Psychology* (Eng. trans., Allen & Unwin, 1930), the latter of which expounds the views of Adler. W. McDUGALL, *An Outline of Abnormal Psychology* (Methuen, 1926), W. H. R. RIVERS, *Conflict and Dream* (Kegan Paul, 1923), and C. W. VALENTINE, *The New Psychology of the Unconscious* (Christophers, 1928), are valuable as containing criticisms and expositions by independent psychologists who accept Freud's views only in part. H. CRICHTON MILLER, *The New Psychology and the Teacher* (Jarrolds, 1921), also takes an independent position.



CHAPTER VI

Routine and Ritual

The activities of humanity, we have said, may be broadly classified as either conservative or creative : conservative when their aim is to preserve in the face of a changing situation some *status quo ante*, creative when their aim is some positive new achievement. The distinction must not be confounded with the distinction between *horme* and *mneme*. Men often throw their energies most strongly into the maintenance of what is and show only a lukewarm interest in what might be. In short, conservative and creative activities are equally natural, and in a sense equally important expressions of human energy, though, taking a long view, we must no doubt think of the former as existing for the sake of the latter.

These remarks have educational applications about which something has already been said (p. 36). But, long before the age of formal schooling, conservative and creative impulses, capriciously intermingled, are already evident in the behaviour of infants. We propose in the present chapter to contemplate children when the conservative mood is most pronounced, in the next when their initiating impulses are most in evidence.

Let us begin, then, by observing that the irreverent radicalism of young children is curiously streaked with conservatism of a pronounced and uncompromising type. Ruthless disturbers of our peace, irrepressible questioners of our way of life, children are yet great sticklers for law, order, and propriety, and so tenacious of tradition that their favourite toys are among the most venerable monuments of civilization and their customary games the last stronghold of faiths that swayed mankind when the world was young. Every woman who has taken charge of another's nursery knows how serious a matter it is to disregard the established precedents in washing and dressing, to violate the ritual of mealtime and bedtime ; and anyone who, in telling children a familiar story, carelessly takes liberties with the text will promptly learn how great is his indiscretion.

In behaviour of this pattern there is something more than mere resistance to change: there is an active reassertion of the past, a positive love of repetition of the familiar. Favourite games of infancy, such as 'Ring a ring of roses' or 'Here we come gathering nuts and may,' exemplify that love—which we may conveniently refer to as the 'routine tendency'—both in the actions and in the accompanying jingles; while for an illustration of the same factor in favourite stories it is enough to mention that classic of the nursery, Southey's masterpiece, 'The Three Bears.'

The crude repetition which forms the salt of so many childish amusements becomes, when elaborated and refined, the rhythmic repetition of the dance, the song, the ballad, the ode, and other forms of art. 'Every child,' says Robert Lynd,¹ 'is a poet from the age at which he learns to beat a silver spoon on the table in numbers. . . . Later on he trots gloriously in reins with bells that jingle in rhyme as he runs. His pleasure in swings, in sitting behind a horse, in travelling in a train, with . . . its wheels thudding out endless hexameters on the line, arise from the same delight in rhythm.' There can be no doubt that this love of rhythmic repetition springs from sources almost as deep as life itself. Rhythm rules in physiological activity, in breathing, in the circulation, in muscular action, in anabolism and katabolism. In many ways, obvious or hidden, the life of man keeps step with the cosmic rhythms of the day and the year. It is natural, then, that the perception and creation of rhythm should be enjoyable and should, among other things, play an important rôle in the evolution of art. It is not surprising to find that among primitive peoples the rhythmic element in music is often highly developed, while the harmonic and even the melodic element is still rudimentary. Much the same was true of Greek music and for the same reason—namely, that the rhythm of music comes from the dance, and dance-rhythms are only the physiological rhythms of natural movement elaborated and formalized. The repetition and 'balance' of pictorial and plastic art and the arts of weaving and embroidery are but expressions of the same factor in other media.

The modern school, following more closely the example of the

¹ In his admirable introduction to *An Anthology of Modern Verse* (Methuen, 1921).

Greeks, would do well to exploit more consciously and thoroughly than at present the natural love of rhythm. Teachers of 'eurhythmics' are seeking to do this in connection with dance-movement and musical appreciation. The simpler and less technical of their exercises might, with great advantage, be taught in all primary¹ schools if only for the sake of fostering good manners, and the dignity and grace of movement which the word *eurhythmia* (εὐρυθμία) implied to the Greeks. It should be remembered, too, that rhythm makes appeal to the reason as well as to æsthetic sensibility. In the teaching of geometry, for instance, much more use might be made of the powerful and satisfying 'principle of symmetry.'

As a child grows older the whimsical impulses in which the routine tendency is at first exhibited shape themselves into more or less conscious conformity with ideals of conduct and social order. We shall deal later with the relation of the tendency to the 'moral sense,' but we may note at once the importance of its connection with the problem of school and classroom order—or, as it is less properly called, discipline.

Graham Wallas remarks² that 'half-conscious imitation . . . makes the greater part of classroom discipline.' The statement explains the form taken by school and classroom order, but accounts only partially for its maintenance as a permanent feature of the social life. To understand this fully we must view it as an operation of the routine tendency, which, when a way of life has once been established, works powerfully to make it permanent. The prudent teacher who recognizes this fact will throw upon that tendency the main part of the burden of maintaining order. He will first take care that the business of the school or the classroom is conducted in accordance with an adequate but simple routine, and will then leave it, as far as possible, to 'run itself.' He will not check developments of the constitution if they are spontaneous and harmless, but will abstain from introducing unnecessary or irritating innovations of his own. He will do wisely to tolerate even an unsatisfactory constitution if it has the force of the routine tendency behind it, and to wait patiently and work cautiously for its amendment. His

¹ This term, wherever it occurs in the following pages, means any school for children between the ages of five and eleven *plus*.

² *Human Nature in Politics*, p. 28.

attitude towards rebels will not be that of an autocrat whose personal will has been flouted, but rather the attitude of one responsible only as *primus inter pares* for the maintenance of a customary order upon which the convenience of all depends. In fine: the routine tendency should be allowed to act in school, as in the wider social community, like the flywheel whose momentum keeps a machine in orderly motion, overcomes obstacles and carries it past the 'dead-points,' where the prime motive forces cease for an instant to act.

At a higher level of activity the same tendency helps greatly to maintain the 'tone' and the 'tradition' in which school discipline, as distinguished from mere order, may properly be said to reside. That is, it helps to secure the continuity in the school of a characteristic *ethos* and of a social custom touched with emotion—things which affect, often in the strongest manner, the young minds that are steeped for sufficient time in their influence. Here we have exemplified on a small scale the phenomena of 'social heredity,' whose most impressive manifestation is the survival of nations, like Serbia or the Ukraine, after centuries of submergence.

If conservation, in the active form of the routine tendency, is so conspicuous in early life, it is natural to suspect that it has for the young a utility distinct from its utility to the old. The suspicion is well founded. Old age clings to the familiar and the customary because it has no longer the energy needed to open out new paths of thought and action; its self-assertion is reduced to self-maintenance in the face of a world growing always more intractable. In childhood, on the contrary, the routine tendency is an expression of superabundant activity. The child hungers to use his growing powers of body and mind, but his repertory of accomplishments is narrowly limited; he loves, therefore, to repeat the familiar, because he gets from it the fullest sense of effective self-assertion.¹

This observation has great practical importance. Modern teachers in their zeal for cultivating the 'self-activity' of children are prone to neglect the significance of the routine tendency. Reacting too far from unintelligent practices of former days, they

¹ Cf. Valentine, pp. 167, 168. Ch. IX is rich in observations of repetitive activity in very young children.

avoid the repetition of the familiar, dismissing it as 'mechanical' or as 'mere memory work,' with the implication that it is somehow out of place in modern methods. They forget that children delight in it for the sound biological reason that it is an indispensable means to mastery of their little world. The young teacher may, then, safely disregard the view that the repetition of 'tables,' dates, grammatical paradigms, arithmetical or algebraic operations is unpedagogical because it has to be forced upon unwilling nature. The child who rejoices in his power to repeat the jingle 'Ena, dena, dina, do' will not fail to delight in a mastery over more serious forms of routine.

This consideration does not, of course, absolve the teacher from the duty of making an intelligent use of the child's love of repetition. Dates should be memorized in order to support, as by a firm chronological skeleton, a body of historical information and ideas that would otherwise be vague and incoherent; the recitation of grammatical routines should be employed to fix knowledge abstracted from concrete linguistic usages; ¹ the mastery of algebraic manipulation should subserve immediately the needs of mathematical thought and should not outrun them; and so on in other cases. It has been suggested that the memorizing of verse and prose does not fall under this rule, and that the child's immediate pleasure in routine-action may legitimately be exploited as a means of storing his mind with passages whose meaning and literary worth he cannot be expected to appreciate for several years. The soundness of the opinion is questionable. It is true that a literary masterpiece, however simple in form, often has depths of significance and beauty beyond the reach of young minds. Unless, however, it has some intelligible message for them, it is highly doubtful whether the routine tendency should be set to work on it.

The foregoing principles have an equally direct bearing upon the pedagogy of the arts and crafts. An excellent authority has urged that a child who has once achieved a piece of constructional work should not repeat it, but should move on to a fresh exercise, involving new neuro-muscular co-ordination and leading to new ideas. He

¹ As in the case of the 'litanies' described in R. B. Appleton, *Some Practical Suggestions on the Direct Method of Teaching Latin* (Heffer & Sons, 1913).

is surely wrong here. As we shall see later, mastery of one's material is a prime condition of æsthetic self-expression; no solid progress in the constructive arts, drawing and music, is possible without the constant repetition of familiar processes until one has them at the finger-ends. The only qualification this statement needs is that technical exercises should never be merely a grammatical drill isolated from creative work. Thus the beginner's five-finger exercises and corresponding exercises in singing should always be melodious; and the mastery of constructional technique should be acquired by making things that are desirable in themselves. At a later stage technical exercises, such as practice in joint-making in carpentry or in button-holing in needlework, may take a more abstract form; but they should always be of the nature of studies for substantive constructional work which the young craftsman or craftswoman has immediately in view. The practice of what were once dubbed irreverently but not inaptly, 'physical jerks' has been transformed upon the same principle. Educative movements are now taught much less through abstract drill than through games, scientifically planned yet joyously exciting.

Freud, in a profound but highly speculative work,¹ has given a view of the facts set out above which in some respects conforms and in other respects is in sharp contrast with the interpretation adopted here. His discussion starts from an observation of the play of a boy of eighteen months, the only child of a mother to whom he was closely tied. Although as a rule well behaved, this infant had the troublesome habit of flinging his toys and other small objects across the room, accompanying the act by a cry which seemed to be his attempt to say (in German) 'Go away.' The conclusion Freud reached was that the child by the constant repetition of this game, in which he deprived himself voluntarily of beloved objects, was, so to speak, schooling himself to endure the pain of separation from his mother which the lady's social habits frequently inflicted upon him. A similar explanation may account for the behaviour of Valentine's child (aged 3), who asked his father again and again to play at 'being a lion' and chase him, even when the game had just

¹ *Jenseits des Lustprinzips*, 1920; translated as *Beyond the Pleasure Principle* (International Psycho-analytical Press, 1922).

ended in screams and tears ;¹ also, perhaps, for the 'fearful joy' children find in the repetition of 'bug-a-boo' stories and other tales of horror. Freud sets beside childish behaviour of this sort the well-known tendency of persons who have suffered a severe shock to revert to the disaster in their dreams, and infers that there is a 'repetition-compulsion' whose biological purpose is to enable the organism to reduce to manageable intensity the influences that assault its peace from without.²

This account agrees with the one given here, not only in assigning to the routine-tendency or repetition-compulsion a place at the very foundations of mental life, but also in seeing in it a means by which children make themselves masters of the situations by which they are faced. Further, it admits that the tendency plays an important part in helping children to 'grow up.' We must admit in return that there is a considerable place in young life for the function Freud ascribes to it of enabling a child to subdue painful experiences. But on the whole there is a marked difference of accent between Freud's treatment of the subject and the one given independently in these pages. Freud, like Arthur Schopenhauer whose brilliance his genius recalls, seems to think life a mistake, a regrettable stirring of the clay. Perhaps it would be juster to say that he finds in life evidence that it feels itself to be a mistake and, however much it may appear to rejoice in itself, is really always seeking the dreamless peace out of which it broke under the relentless pressure of external influences. Thus the instincts of animals, which 'present the delusive appearance of forces striving after change and progress,' are in truth expressions of a deep-hidden longing to return to an earlier state from which life has been driven by the ever-changing forces that beat on it. The migrations of birds and the mysterious return of some fish (*e.g.*, eels) to what may have been their earliest home seem to fit in well with this explanation ; but (says Freud) the way in which the growth from the germ-oell follows the long

¹ Valentine, p. 151.

² The writer of an obituary notice of J. M. Barrie, the novelist and playwright, remarks that 'he told the truth as he saw it ; and for relief to his sensitiveness he would so play, either with or for children, as in *Peter Pan*, or in ingenious nonsense, or by making toys of the very ideas which hurt him.' (*The Times*, June 21, 1937.)

history of the race instead of moving directly to the animal's final shape, is a still more imposing proof of the organic compulsion to repetition. In short, all the mnemonic impulses that fashion the individual life are 'death-instincts,' inasmuch as they really look backwards towards the dust; the only 'life-instincts' are the sexual drives whose activity points forward to the renewal of the empty game in successive generations. But, as Freud observes in a final touch of pessimism, perhaps even the immortality these seem to guarantee to the racial life 'only means a lengthening of the path to death.'

It is idle to argue with basic attitudes of this kind. The reader will be uncommonly fortunate if he does not at times fall into the Freudian mood and, like Swinburne¹ when the same disease of *accidia* plagued him, deem it a matter 'for brief thanksgiving'

That even the weariest river
Winds somewhere safe to sea.

Nevertheless he will, it may be hoped, hold the truer insight to be that which sees life as a gift and not as a curse, and the instincts not as 'repetition-compulsions' binding life to its dismal round, but as the ways that open to it the unending riches of which it is capable.

We turn now to another type of routine-actions of which we have familiar instances in the ceremonies used in laying a foundation-stone, at weddings, at the coronation of a king, and in the office of the Mass. The character and sequence of such routines are often jealously preserved and faithfully transmitted through long periods of time, but they are clearly distinct in their functions from those we have hitherto studied. Those routine-actions had substantive value—that is, the actions were in themselves desirable and desired. The value of these consists not in themselves, but in what they symbolize. In brief, their biological utility lies in their power of arousing in actors and spectators, as often as they are repeated, states of feeling or emotion that are frequently of great social importance.

The most convenient name for these symbolic routine-actions is *ritual*. Ritual fills in the life even of the sober Englishman a place

¹ In 'The Garden of Proserpine.'

larger than is commonly recognized; but the ritual observances of the most emotional civilized people are only shreds and patches of the elaborate practices of primitive tribes.¹ For instance, May Day rites, now scarcely more than a memory in this country, are remnants of ancient festivals which, though taking different forms among forest-dwellers, agricultural folk and pastoral people, were always mimetic shows of 'the seasons' difference,' conventionalized, and fixed in form by a sacred tradition. They were enormously important to the public welfare; for, as everybody knew, the ritual, duly performed, had power to compel the earth to bring forth its kindly fruits in due season. The modern sociologist, who has other views on agricultural science, must still admit the psychological efficacy of the rites. For if they did not directly make the corn grow, they did so indirectly by transmuting vague anxiety about the food supply into an exalted corporate emotion that could not fail to inspire and co-ordinate individual effort.

Good authorities maintain that both primitive theology and art took their beginnings from ritual observances of this kind. For example, it is suggested by Jane Harrison that belief in the god Dionysos may have sprung from a vivid way of conceiving the common and therefore permanent elements in the yearly rite of 'carrying in the summer.' Where a may-pole was the centre of the rite he would be conceived as a Tree-god, where a holy bull was the focus of the ritual as a Bull-god, and so on. When life became easier and the social structure more complicated, the practice of the ritual would tend to become a professional business rather than a universal obligation. In this way the rites of Dionysos seem to have developed into that wonderful and sophisticated thing, the Greek tragedy; that is to say, ritual passed into art. Nor is this statement to be restricted to the drama and the arts immediately connected therewith. To a large extent, we are told, Greek sculptural art 'comes out of ritual, has ritual as its subject, is embodied ritual'; while even 'drawing is at bottom, like all the arts, a kind of gesture, a method of dancing on paper,' and is therefore derived in the long

¹ See W. H. Rivers's *The Todas* (Macmillan, 1906) for a striking account of the immense importance of ritual observance in the life of a primitive people; also Spencer and Gillen, *The Native Tribes of Central Australia* (Macmillan, 1899).

run from ritual.¹ Meanwhile among simpler or ignorant people the ancient rites, often, it is true, sadly maimed, have persisted side by side with their cultivated derivatives and continue to perform their primitive function as magical practices or as vehicles of lively social emotions. We still break a bottle of wine over a newly launched ship 'for luck,' the Swabian peasant still leaps high over his hemp so that it may grow tall, while in the Christian villages of Thrace, the original home of Dionysos, 'a drama is still annually performed which reproduces with remarkable fidelity some of the most striking traits in the Dionysiac myth and ritual.'²

To suppose that modern art and religion draw their strength exclusively or even largely from these ancient sources would be to make a profound error. Nevertheless, if there is any validity in the recapitulation-theory (p. 46), ritual, properly employed, should still have an important function in school-life. The success of such revivals as historical pageants in honour of the *genius loci* of some ancient city or shire, the annual performance of mystery-plays, village dance-festivals, and other reactions from the drabness of nineteenth-century life, shows that even in the greater world ritual retains its power to communicate and exalt feeling among masses of people. We may, therefore, with greater confidence, give it a larger place in the education of the young, using it as a means of intensifying and purifying social emotion.³ The main conditions of success are that the occasions shall be worthy and the expression sincere. Athletic festivals fulfil the second condition, but occasions better, or at least more varied, may easily be found. The seasons

¹ This explanation has been applied to the wonderful drawings of the cave-men of Altamira. See Sollas, *Ancient Hunters*.

² Sir J. G. Frazer, 'Spirits of the Corn and Wild' (Pt. V of *The Golden Bough*), Vol. I, pp. 25-9.

³ All over the primitive world ritual observances play an extremely important part in the 'initiation' of boys and girls at puberty into membership of their tribes. See W. D. Hambly, *Origins of Education among Primitive Peoples* (Macmillan, 1926). Missionary bishops in Africa have in some cases recognized their importance in the tribal life by incorporating them in part into the Christian rite of confirmation. On the whole question of the advisability of taking account of tribal customs and rituals in native education, see W. B. Mumford, 'Education and Social Adjustment of Primitive Peoples through European Culture' (*Africa*, April, 1929).

are still venerable deities whom children will delight to honour by song, procession and ritual dance.¹ For older boys and girls the festivals may be associated with important events in school-life—such as the appointment of prefects and the dismissal of senior scholars into the world—or with civic and national interests and history.² In all cases it is important that the ritual should not bear too obviously the stamp of external authority, but should, as far as possible, be crystallized and refined from spontaneous movements among the citizens of the school society. It should give work for the young poets, musicians, actors and craftsfolk, and should provide a place for the ungifted girl or boy who can only carry a banner or join in a chorus. We may add that valuable hints with regard to suitable occasions and forms of ritual may be derived from a study of the ceremonies prescribed for use among 'wolf cubs' and boy scouts. Also that for some years F. H. Hayward, a London school inspector, sought to develop a method of 'school celebrations' which aimed, in the spirit described above, at exalting the men and causes that have meant most to human progress and enlightenment. In these celebrations, for which there should certainly be a place in school-life, song, speech and ritual are combined somewhat as in the liturgies of religious societies.

NOTES ON BOOKS, ETC.

J. SULLY, *Studies of Childhood* (Longmans, new ed., 1903), gives a pleasing account of the facts referred to at the beginning of the chapter. The quotations towards the end are mostly from Miss JANE HARRISON's little book, *Ancient Art and Ritual* (Home Univ. Library, 1914). C. DELISLE BURNS, *Greek Ideals* (Bell, 1917), gives a vivid picture of the importance of public ceremonial in ancient Athenian life. F. H. HAYWARD and A. FREEMAN, *The Spiritual Foundations of Reconstruction* (P. S. King, 1919), deals specially with the use of ritual in school-life. F. H. HAYWARD, *First and Second Books of School Celebrations* (P. S. King, 1920), give full text and 'stage-directions' for a number of celebrations.

¹ It may be suggested that a May Day festival might well become an annual event in all primary schools, and be made a means of valuable culture in manners, music and dancing.

² The 'Empire Day' celebrations initiated by the late Lord Meath have become general and popular, but so fine an opportunity has hardly yet been utilized with sufficient imagination.

CHAPTER VII

Play

The creative activities of youth have, like the conservative, a typical and pronounced form of manifestation. It is play.

The spirit of play is an intangible and elusive sprite, whose influence is to be found in corners of life where it might least be expected. Every one agrees, however, that childhood is her peculiar sphere, and that she manifests her presence there in activities whose special mark is their spontaneity—that is, their relative independence of external needs and stimuli. It is for this reason that play is commonly interpreted as an expression of ‘superfluous energy.’ During childhood and youth, it is said, the organism has at its disposal more energy, both physical and psychical, than it needs either for mere self-maintenance or for physical growth, and it expends the surplus largely in the form of play.

Upon this view a child at play may be likened to a locomotive engine which has taken from the coal more energy than is needed to draw the train and is therefore compelled to ‘let off steam.’ The analogy is, however, defective in one important respect. In the modern railway engine some of the energy not required for locomotion is employed to exhaust the vacuum brakes and warm the carriages. Without much extravagance of fancy we might suppose this use of the superfluous energy to be considerably extended. For example, the driver, instead of blowing off steam in a station, might direct it to a small rotary press in the guard’s van, where a few copies of the next month’s time-table might be printed. But the liveliest imagination cannot conceive it as used to improve the engine itself, to make the boiler tubes more efficient, or to increase the harmony of relations between pistons, cranks and wheels. Yet in the psychophysical organism play does something precisely comparable with this. In play—first the play of arms and legs and fingers as the babe lies in his cradle, then run-about play, and later the formal games of the playground and the field—the child gradually enters into possession of his own body, and raises his command over

it to the highest possible power. Again, he finds and exercises in play his intellectual gifts and powers, and often discovers the interests that are to fill the central place in his adult life.¹ Lastly, it is a commonplace that, just as of old the Hellenic ideals of life and conduct were fostered and spread by the great games and festivals, so to-day many a boy finds and establishes his moral and social self largely in the corporate games of adolescence—a statement which is becoming increasingly true of girls also.

These familiar facts all illuminate a single truth—namely, that the play-activity is subject to the general law that spontaneous activity, when not baffled or obstructed by unfavourable circumstances, tends always towards increasing perfection of form, to more complete expressiveness, to a higher degree of unity in diversity. Thus we are led to the idea that nature invented play not merely as a means of disposing harmlessly of the young animal's superfluous energy, but as a device for using that energy to prepare him for the serious business of life.

This view of the biological utility of play was suggested long ago by the philosopher Malebranche² but was first fully formulated and defended by Karl Groos.³ Groos's theory is based upon two observations. He notes first that play is confined to animals which are at birth not sufficiently developed to face the difficulties of life without the help and protection of their parents. The puppy, born blind and helpless, enjoys some months of undiluted play; the chick, who, a few minutes after he is hatched, can pick up a grain of rice or tackle a worm, affects *ab ovo* an almost puritanical severity of behaviour. Secondly, Groos bids us observe that when an animal plays he always imitates in sport what will be the serious activities of his adult days. The kitten hunts a ball of wool as he will later hunt a mouse; the puppy chases and dodges his brother as he will some day chase and dodge his prey or his foe. When these facts have once been perceived, the interpretation is easy. A

¹ 'My choice of a military career was entirely due to my collection of toy soldiers . . . the toy soldiers turned the current of my life.' (From Rt. Hon. Winston S. Churchill's autobiography, *My Early Life: A Roving Commission*, pp. 33-4.)

² See Drever, *Instinct in Man*, p. 33.

³ In *The Play of Animals*, 1896, and *The Play of Man*, 1898

playful youth is a biological device to secure to the higher animals an efficient equipment for the battle of life. It is not so true, says Groos epigrammatically, that animals play while they are young as that they are young so long as it is necessary for them to play, in order to prepare themselves for the serious business of adult life.

There is no difficulty in extending this explanation to the play of childhood. The devotion of the little girl to her doll is the capital instance of a playful activity which is plainly anticipatory of the serious business of adult life.¹ A similar interpretation may be applied to other games which recur with unbroken regularity in every generation and among children of every colour. There is, however, in respect of play, as in respect of all mental phenomena, a most important difference between man and the lower animals. The adult activities of these are relatively few and relatively constant in pattern. Consequently the play of each species is stereotyped and shows little variety. On the other hand, the adult life that awaits the child is very largely undetermined. Nature, therefore, while she bids the young beast rehearse in sport just those activities which he will certainly use some day in earnest, prompts the child to experiment even in infancy with all kinds of movements, and endless imitated or invented occupations, and, as he grows older, with play in which he conceives himself as an airman, a sailor, a post-man, a big-game hunter, and as following other attractive modes of life. In this way we may account on biological principles for the incessant 'make-believe' which is so universal a characteristic of childhood.

According to Karl Groos, then, play, biologically considered, is anticipatory. According to another interpreter, Stanley Hall,² it is often more properly to be regarded as reminiscent. In his view, the plays of childhood are simply incidents in the recapitulation, which the life of every individual exhibits, of the history of the

¹ Sceptical psychologists may view it as only an instance of children's delight in imitating adult activities that interest them. Saving the 'only' this is doubtless true; but little girls find in this particular activity an attraction that seems to imply special biological significance.

² *Adolescence*, Vol. I, Ch. III. The reader should remember that contemporary biologists and psychologists look askance at Hall's sweeping and confident applications of the recapitulation-principle.

race. For example, the absorption of the boy of nine in imaginary hunting and bloodshed is, like the characteristic bodily form at that age, a momentary representation of a pigmoid or Bushman stage which the race has long left behind. These developmental incidents may have no more direct reference to adult needs than the tail of the tadpole has to the needs of the frog. Nevertheless, says Hall, their transitory appearance in due course is necessary to a healthy manhood just as the batrachian must produce and absorb his tadpole tail before he can settle down as a reputable frog.

When we ask for the biological reasons why the play of childhood should thus keep alive the memory of phases in the racial history which had better be forgotten, Hall tells us that they are often cathartic in their operation. Man cannot shed altogether the ancient tendencies to cruelty and vice, but play is at once a means by which the mischief may be taken out of them and a means by which they may be transformed into impulses of ethical value.

It is permissible to suggest that these two theories are complementary rather than opposed. Thus it may be true that spontaneous play often derives its typical features from the adult life of distant ages, and also true that these racial memories still reawaken in each generation because they have a direct value for the adult life of the present epoch. If that is so we shall be free to use them both in accordance with their relevance to particular cases. For example, Hall's view is most helpful in the case of play which, like dancing and outdoor games, is fundamentally a motor phenomenon. His dictum that 'play is the purest expression of motor heredity' is here peculiarly illuminating. It leads straight to the idea that the substitution of dancing, eurhythmics and acting for some of the more formal physical exercises may not only help the Briton to take his pleasures less sadly, but may be the best way of securing for him mastery over the body which he has inherited from his forbears. On the other hand, where play engages the intellect rather than the body, Groos's interpretation is the more instructive and, as we shall see later, the more fruitful from the standpoint of the educator.

The 'superfluous energy' theory, illuminating as it is, does not, in its direct form, cover all the ground.

Consider, for example, the weary child who forgets his aching

legs when the monotonous walk is turned into a game of hide-and-seek, or the tired man who returns to his work refreshed from a game of billiards or golf. It is clear that play is in these cases not a channel of discharge for superfluous energy, but a means by which new energy is placed at the disposal of the organism. According to the common explanation, the efficacy of such 'recreative' play lies in the fact that it uses the energy of fresh tracts of the nervous system and gives the exhausted tracts time to get rid of the chemical poisons which have accumulated in them and to make good their losses by anabolism. The examples here given, especially the former, show that this explanation is quite insufficient. Under the influence of play, the child not only continues the activity which had wearied him, but actually puts twice as much vigour into it.

It is probable that a better explanation will be found in one of the many profound and illuminating ideas which psychology and education owe to William McDougall. In a notable study of fatigue,¹ McDougall quotes instances to prove that the energy we can expend upon a certain kind of work is not necessarily limited to the energy put into operation by the machinery directly concerned in its production.² Many cases of long-sustained activity would be unintelligible unless this was supplemented by energy drawn into the activity from other sources: namely, the innate dispositions (or instincts) that are the great springs of behaviour both in beasts and in men (see p. 42).³ It may be suggested that in recreative play we have phenomena essentially the same as those which McDougall

¹ *Report of the British Association, 1908.*

² The use of the term 'energy' in psychology has caused much discussion. Without inquiring what exactly McDougall meant by it—here and in his other writings—we may state that it is to be taken in this book in the popular sense—the sense from which its technical meaning in physical science was derived. It is the sense in which a man may be said to abound or to be deficient in energy according to the liveliness and practical efficacy of his actions.

³ McDougall quotes from William James the case of Colonel Baird Smith, who, during some months of the siege of Delhi, hardly ate or slept or rested in any way, but worked almost continuously at tremendous pressure without showing or feeling fatigue. This example could be paralleled by many striking and terrible instances taken from the late wars.

describes. The task which the appropriate impulse has insufficient energy to perform is conquered by means of energy drawn from the more massive inherited engram complexes. So the hardships of a river picnic may be endured joyfully by virtue of the energy derived from a mild and perfectly conscious flirtation. So the boy at the bottom of the class can perform prodigies of learning when he is fighting for his side in a Latin match between opposing teams.

The types of play-activity called 'games' and 'sports' are generally spoken of as recreation, and it may be granted that they frequently perform the function we have ascribed to recreative play. It should, however, be noted, first, that they often serve merely as vehicles for the direct discharge of superfluous energy; and, secondly, that they often perform a function, distinct both from this and from recreation—a function best described as 'relaxation.' To understand the biological meaning of relaxation, we must first observe that games, such as football and dancing, and sports, such as hunting and fishing, differ from inventive or imaginative play—the former in that they are activities ruled by a definite formula or routine, the latter in that they are behaviour coming obviously under Hall's theory of atavistic reversion. They are alike, then, in being activities based directly upon elements deeply rooted in the agent's disposition. In other words, the hormic systems that come into action in games and sports are always firmly consolidated and are often, in addition, of great antiquity. This fact accounts, in the first place, for the readiness with which they become vehicles for the discharge of superfluous energy. It also accounts for their use, both by adults and by young people, as means of relaxation. The daily work of the business or the professional man, especially in a highly organized modern community, throws a great strain upon the organism; for it involves the action and maintenance of extremely elaborate and artificial hormic systems. From time to time, therefore, the agent seeks relief by simplifying his life—that is, by turning to activities that involve less complex and more firmly established hormic systems. These he finds in games and sports. He deserts his office for the golf-links, or flees from his 'practice' to a trout stream in the quiet depths of the country. For the same reason the schoolboy wel-

comes the moment when he may escape from the oppressive labour of classroom or study to the playing field or the river.¹

There is no doubt that abundant opportunities of play are essential to children's healthy and happy development. In nursery schools, where children spend many hours in free and spontaneous play, sometimes alone, sometimes joining with others, observant teachers have noted that its function seems now and then to take a form recalling that of the 'repetition-compulsion' as described by Freud (p. 73). Here are a couple of instances.² (i) Mary, aged 4, distracted her mother and annoyed the neighbours by opposition to the daily bath so violent and noisy as often to make it impossible to complete the rite. When she joined the nursery school it was noticed that she played almost entirely at bathing a doll, washing its hair and drying it; and it was only after some weeks, when a relieved mother arrived to thank the teachers for their supposed help, that it became plain that Mary's self-chosen play had somehow taken the sting out of bath-time, so that she now actually enjoyed it. (ii) Betty, also aged 4, was a more troublesome case, for she had the unpleasant habit of falling upon younger infants, embracing them so roughly that they cried, and then wiping their eyes with fierce and indeed rather dangerous vigour. But, one day being attracted by a scrubbing-brush and pail in the playroom, she immediately appropriated them, and thereafter spent long periods daily in hard scrubbing and in wiping up the water spilt on the floor; and, as the result of finding this *métier*, now rarely attempted to hurt younger children or to 'dig' at their eyes.

There seems no reason to question the face-value of such observations as these—namely, that, in the stable, happy *milieu* of a nursery school, rich in play material, a child's self-chosen activities have a virtue that helps to straighten out the crookednesses and entangle-

¹ See G. T. PATRICK, *The Psychology of Relaxation* (Constable, 1916). This writer invokes the same biological conception to explain the present vogue of the 'photo-drama,' the psychological function of profane swearing, the use of strong drink, and the periodic relapse of civilized peoples into the barbarism of war. The reader may attempt, as a rider on the foregoing argument, to account himself for these several forms of 'relaxation.'

² Kindly communicated to the author by Miss D. E. May, lecturer on Nursery School methods in the Fishponds Training College. The subject is treated fully in M. Lowenfeld, *Play in Childhood* (Gollancz, 1935).

ments that distort some children's minds and behaviour. Psychoanalysts who apply their methods to young children¹ do not stop here; they seek a fundamental interpretation of the child's abnormalities, and are prone to find them in ideas that their critics sometimes suspect to be of doubtful validity.²

Changing the standpoint we have now to inquire what are the distinctive marks of play as a mode of experience. The reply frequently given is that play is activity pursued for its own sake *as* activity and without regard to any value in the product. It is thus contrasted with work, in which the activity is pursued for the sake of some further value beyond itself. We must concede a certain validity to the statement. An adult often makes this distinction between his work and his play, and even young children may be obscurely aware of something equivalent to it. For instance, the Directors of the Caldecott Community³ (a boarding-school for the children of wage-earners) remark that 'at one time it was hoped that no hard-and-fast line would need to be drawn between work and play, but that the term "occupation" might cover activities of study and playroom alike. A certain standard of work, however, is demanded in the schoolroom, even by the children themselves, whilst during playtime no standard is required; and this seems to constitute the essential difference between the two.'

Interesting and important as this observation is, we must be careful what general conclusion is drawn from it. It is notorious, for example, that among the boys and sometimes even the masters⁴ of our public schools it is play rather than work that is felt to have value beyond the activity itself, and to impose upon the agent a high standard of aim and disciplined effort. And among adults we have the musicians and actors, who accept the name of 'players'

¹ *E.g.*, Mélanie Klein in *The Psycho-analysis of Children*.

² See Valentine, pp. 179-83, for a candid and cautious discussion of this question.

³ In their Report for 1916-17. One of the Directors, Miss Rendel, has contributed an account of the Community to Clarke Hall's *The Child and the State* (Headley, 1917).

⁴ The character called 'The Bull' in Alec Waugh's novel, *The Loom of Youth*, illustrates the attitude strikingly.

but would resent the suggestion that their activities have no value and are unruled by standard as bitterly and as justly as they would the implication that their 'playing' is not work.

These are not exceptional or unfair instances. They merely show, in a particularly clear way, that, as F. H. Bradley once urged,¹ it is impossible to maintain a psychological antithesis between play and work. What, then, is really the distinction which the rejected antithesis misrepresents? Here we may well accept Bradley's further guidance. According to his analysis the psychological colour of our activities is chiefly due to two factors which enter into them in varying proportions. One of these factors consists in the conditions which are imposed on the agent *ab extra*; the other is his spontaneity. The difference between the two appears readily in the analysis of any activity—for example, eating one's dinner. The mainspring of this activity is obviously an imperative, which no one can ignore and live. Nature says: Thou shalt eat. But she leaves a fortunate minority of us considerable freedom to choose the matter and the manner of our eating. We may dine in slippers ease on a chop at home, or we may go forth in state to an eight-course banquet at a fashionable restaurant. The boundary between spontaneity and external constraint shifts, of course, from person to person. At the gorgeous tables of the great there may be many hankers after the simple life. They hate the *Persicos adparatus*, but their circumstances of life cause these to be among the unalterable conditions of dining.

In this illustration the external constraint is ultimate. I need not necessarily eat here or thus, but eat somewhere and somehow I surely must. In other forms of activity the constraint which limits it is not ultimate. Thus, if I play football or auction bridge, I am bound by the rules of the game; but the acceptance of the rules is itself voluntary. I can escape them by standing out of the game or by persuading my companions to adopt a new code. But if I decide to 'play the game,' my spontaneity must limit itself to the operations of attack, defence and finesse which the rules sanction and the tactics of my opponents leave possible. Similarly if I decide to fill the rôle of Hamlet in a performance of the tragedy

¹ In his article, 'On Floating Ideas and the Imaginary' (*Mind*, N.S., No. 60).

Shakespeare's text becomes a condition of restraint, and spontaneity is limited to 'interpreting' the poet's lines.

Here, then, is the basis of the limited validity we grant to the antithesis between play and work. An agent thinks of his activity as play if he can take it up or lay it down at choice or vary at will the conditions of its exercise; he thinks of it as work if it is imposed on him by unavoidable necessity, or if he is held to it by a sense of duty or vocation. For in activities of the former class spontaneity rules almost unchecked, while in those of the second kind it is often obstructed by constraining conditions. But where spontaneity is able to triumph over these, the *experience* has always the quality typical of play, whether the activity be called 'play' or 'work'; from the inner standpoint, the two become, in fact, one and indistinguishable. Thus, if I am a successful engineer, or an inspiring teacher, or a skilful surgeon, my 'work' may have all the felt qualities of play; while if I am a duffer at my profession its exercise may be an intolerable burden. In short, any task becomes play to one who can do it with the ease of mastery that brings joy in the doing.

The connection which languages so commonly recognize between 'playing' and the arts of music and the drama has been made by some thinkers, notably the poet Schiller, the basis of a philosophy embracing all art in its scope. This affiliation of art to play is far from implying a mean estimate of the artist's labours. It proceeds from the sound observation that the soul of art, like that of play, is the joyous exercise of spontaneity. Even in cases where poets 'learn in suffering what they teach in song,' we may be sure that they find a rich, if austere, joy in their power to transmute their sorrows into pure and noble self-expression. Again, art is continuous with play, inasmuch as it exhibits on a higher level of seriousness and value the submission of energy to form. Just as the delight of the true cricketer is not in the mere expenditure of physical energy but in the expression of his strength in the disciplined forms prescribed by the tradition of the game, so the nobler joy of the painter, the sculptor, the poet, the musician comes from the triumphant expression of spiritual energy through 'significant forms.' We may expect, then, as Schiller has profoundly observed,¹ that the nature

¹ *Ueber die ästhetische Erziehung des Menschen*, Letter 15.

of a people's play will foreshadow the quality and value of its art. It is not an accident that the noblest achievements of antique art were won by the race that cherished the humane and healthy Olympic games, not by the race that loved the horrible sports of the gladiatorial arena.

The reader may profitably reflect upon the connection between Schiller's doctrine and the remarks about the cultivation of ritual which we made in the preceding chapter. Meanwhile let us note that a doctrine similar in essentials to Schiller's theory of 'pure' art has been applied by William Morris and other modern writers to craftsmanship. In their view beauty in craftsmanship is a play-phenomenon; for it is simply the disciplined expression of the maker's delight in a process he has learnt to carry out with the ease of mastery. Let us suppose that we could have watched the early stages of one of the crafts to which the primitive masters of mankind devoted their genius—for example, the manufacture of flint weapons or of earthen pots. However great the ability that was brought to bear upon those inventions, there is little doubt that the bare solution of the problems they presented absorbed it all. The first spear-heads were merely things that would pierce the body of a beast or a foe; the first pots were merely things that would hold water and resist heat. But as repetition of the process brought skill and mastery over the materials, the bare solution of the problem demanded less and less energy, and more was available for other purposes. Given that the craftsman took pleasure in his work and that his labours were inspired by worthy emotions, the superfluous energy, says the theory, would inevitably express itself as beauty. The flint weapon, the pot, became more than a mere weapon, a mere pot; they became beautiful.

This doctrine has great importance for æsthetic education. It teaches that the power to produce beauty is not a gift grudgingly given by the gods to a mere sprinkling of fortunate beings; but an ability which, though varying in strength, like other abilities, from individual to individual, is yet as universal as the power to learn arithmetic. Let boys and girls make under conditions that stimulate the natural flow of energy, let their social *milieu* be free and humane, let them acquire by pleasant repetition (see pp. 71-2) the mastery that enables them to *play* with their materials—and beauty

will inevitably appear, though in varied measure, in the things they create.

We turn now to another element in play upon which much stress is commonly laid—the element of ‘make-believe.’ In considering it we must beware, as W. H. Winch warns us,¹ of reading phenomena of adult life into the play of children. To the adult mind no distinction seems so evident and so sharp as the distinction between the hard, cold world of objective fact and the subjective world of purpose, thought and fancy. We are prone to forget that the child does not find this distinction ready made for him, but has, by gradual and often painful experience, to discover its existence and nature. Thus, as Winch urges, much that is attributed to the child’s faculty of making-believe may be due not to the transforming power of imagination but to ignorance and a sheer inability to see the world around him as it really is.²

Where making-believe indubitably takes place its function may usefully be compared with what happens in cases of conflict between two hostile complexes or systems of ideas and emotions in a diseased mind. Very generally one of these drives the other entirely out of the field of attention—as when a lady,³ who constantly maintains that she is the rightful Queen of England, ignores the incompatibility of her royal status with the lowlier duties of charring by which she earns her living. The normal child at play has the same power of ignoring realities that challenge the truth of his ideas. ‘The chair he has just been besieging as a castle, or valiantly cutting to the ground as a dragon, is taken away for the accommodation of a morning visitor, and he is nothing abashed; he can skirmish by the hour with a stationary coal-scuttle; in the midst of the enchanted pleasance he can see, without sensible shock, the gardener soberly digging potatoes for the day’s dinner.’⁴

In other cases of insanity the complexes are so equally matched

¹ ‘Psychology and Philosophy of Play’ (*Mind*, N.S., Vol. XV).

² Compare R. L. Stevenson’s remarks on children’s imagination in the essay on ‘Child’s Play’ in *Virginibus Puerisque*. The subject is studied with much careful detail in Piaget, *The Child’s Conception of the World* (Eng. trans., Kegan Paul & Co., 1929).

³ This illustration is taken from Bernard Hart, *Psychology of Insanity* (Cambridge Manuals of Literature and Science).

⁴ Stevenson, ‘Child’s Play.’

that neither can suppress the other and a *modus vivendi* must somehow be found. This is generally made possible by a supplementary set of ideas which—simply because they reconcile the incompatibility of the original complexes—may be embraced by the patient with the utmost fervour of belief. Thus the rightful Queen of England may become convinced that her actual humble position is due to a conspiracy to keep her from her throne, and find evidence of the plot at every turn.

By precisely similar devices, adopted with something of the same conviction, the child is wont to reconcile facts and ideas whose warfare would disturb his mental peace. Here, often, is the explanation of a child's fibbing and of his inability to keep the memory of facts free from the embroidery of fable. It is, further, one of the commonest features of his 'make-believe' play. From Stevenson's mine of illustrations comes a gem of the first water. It is the story of a little boy who could join in a game of football only upon the theory that it was a battle, and 'was mightily exercised about the presence of the ball, and had to spirit himself up, whenever he came to play, with an elaborate story of enchantment, and take the missile as a sort of talisman banded about in conflict between two Arabian nations.'

Instances such as these show that the mind of a child at play may, like the mind of an insane adult, be at the mercy of a group of ideas which, though it has little or no relation to the actual world, may capture and control the whole current of his consciousness. Stevenson tells us how for weeks together a child may be unable to deal with the most ordinary and humdrum situations of life except in terms of the fancies dominant at the moment. 'Perhaps,' he writes in an admirable passage, 'the most exciting moments I ever had over a meal were in the case of calves'-feet jelly. It was hardly possible not to believe . . . that some part of it was hollow, and that sooner or later my spoon would lay open the secret tabernacle of the golden rock. There, might some miniature Red Beard await his hour; there, might one find the treasures of the Forty Thieves and bewildered Cassim beating about the walls. And so I quarried on slowly, with bated breath, savouring the interest. Believe me, I had little palate left for the jelly; and, though I preferred the taste when I took cream with it, I used often to go without, because the cream dimmed the transparent fractures.'

The analogy between the child's making-believe and some phenomena of insanity is instructive, but it must not be pressed too far. A child's mind is rarely so securely bound to its fancies that it cannot escape from them easily enough if need arise; and, as Stevenson points out, a single touch of pain will suffice to bring him back to the actual at any moment. Moreover, there is a fundamental difference between the deeper significance of making-believe and insanity which their formal resemblance must not lead us to overlook. The delusions of the insane are not merely the jangling of sweet bells out of tune. They can generally be interpreted biologically as the refuge of a weak spirit which cannot bear 'the weary weight of all this unintelligible world.' They are the expression of a *defect* of energy. The strong mind faces its troubles and, by opposing, ends them. The weak mind gives up the attempt to maintain relations with the whole of the real environment, and simplifies the problem by ignoring a great part of it. On the other hand, the making-believe of the child is, as we have seen, an expression not of a defect, but of an overplus of energy. The impulse which drives the child along his life's course is not wholly absorbed by the activities necessary to maintain relations with the actual world. It urges him to multiply and enrich his experiences, to enlarge his soul by experiments in a thousand ways of life. Insanity is a phenomenon of shrinkage, of decay; the child's making-believe is a phenomenon of expansion, of growth.¹ Unable, through weakness and ignorance, to bend the stubborn reality of things to his will, to achieve his far-reaching purposes objectively, he employs the magic of making-believe, as Aladdin employed the genie of the lamp, to supply the means his ends demand, to make the world answer to his heart's desire.

According to this explanation the child's habit of making-believe does not imply that he prefers his fantasy-world to reality. It is merely a biological device to secure that his self-assertion during the formative years of life shall not be frustrated by his inability to control the real conditions of his activities;² and that he should

¹ Compare what we have said about the routine-tendency (p. 71).

² This observation has a close bearing on the dispute between the orthodox Froebelians and the followers of Montessori with regard to the educational value of play. The controversy follows largely from the fact that both

be enabled to master gradually the problems presented by the world of material things. We should expect, therefore, that as age brings fuller knowledge and completer command of that world, the make-believe element would diminish in importance. And that is precisely what we find. Stevenson's little *campeador* skirmishing valiantly with the coal-scuttle is at the first level of the process. The nursery-world yields none of the conditions his heroic impulses demand; so fancy must translate it into a stage suitably set for knight-errantry. Don Quixote, a grown-up child, could satisfy like impulses with a less extensive transformation of reality. His arms and accoutrements were real and Rozinante was genuine horse-flesh; but fancy had to turn the windmills into giants. Thus the Don's famous deeds typify a stage in which spontaneity, though it cannot dispense with making-believe, has yet captured at least some of the real conditions for the activity it has chosen. The same stage is illustrated by a young friend of the author, who having recently been photographed, thirsted to be himself a photographer. A cardboard box and a magnifying glass were easily fashioned into a camera, and, casting a shawl over his head, the boy performed with exact verisimilitude the process of focusing the picture on the screen. Then came the crux. He knew that the image must be received on a sensitive plate and developed by chemical action. Unhappily he had neither plate nor developer nor any hope of obtaining them. It was here that the power of making-believe—the fairy godmother who turned Cinderella's rags into jewelled splendour and the six mice into prancing steeds—came to his aid. The only fluid, recognizably 'chemical,' upon which he could lay his hands was vinegar; but why should not vinegar do? So with scrupulous care he took the 'plate' into a dark cupboard, solemnly washed it with vinegar,

sides tacitly assume making-believe to be an essential feature of play (as distinguished from games). The Froebelians, believing that play has great educational value, encourage the child to make-believe because they think he cannot play without doing so. The Montessorians, who regard making-believe as frivolous and a form of untruth, are driven for the same reason to dispute the educational value of play. From the standpoint taken in the text, Froebelian practice errs where it introduces making-believe gratuitously, that is, where the child's spontaneity does not need its aid, and the Montessorians err in refusing that aid where it would serve to widen the child's range of serious interests and achievements.

and persuaded himself that the lines of his picture, faint but unmistakable, were actually fixed upon the surface.

Only childhood enjoys the privilege of fulfilling its impulses by this high-handed treatment of inconvenient facts. As reality closes round the boy his ideas are forced into ever-increasing congruence with the external world ; instead of controlling they become themselves controlled. Nevertheless, the power of making-believe remains, and may still perform an essential function in securing freedom for the development of spontaneity. We owe by far the most impressive example of this truth to the psychological insight and happy invention of the founder of the Boy Scout movement. The basal assumptions of the Scout organization are pure make-believe ; the scout's picturesque costume, his 'patrol-animal' or totem, his secret signs, his 'spooring,' all belong to a realm of facts and ideas queerly incongruent with the humdrum actuality of civilized life. Yet the geography, geometry, and nature-lore that he learns as a scout are genuine science ; the moral lessons he receives are not only entirely serious but have a strong and abiding influence upon his character ; and it is from the atmosphere of making-believe that he draws the intellectual and spiritual vigour which make what he thus learns often far more valuable than anything he acquires from his teachers at school. It is not surprising that, impressed by this fact, a number of headmasters and headmistresses of secondary schools have boldly converted their junior forms into troops of boy scouts or girl guides.¹ Their experience should throw valuable light upon the question whether the movement can retain its energizing power within the school walls and over the whole range of the curriculum.

An interesting and important question is raised when we ask what is the natural sequel to the boy scout stage in education. The problem is to determine the form the fantasy-element should take as the youth's ideas reach still closer congruence with the actual conditions of adult life. In the opinion of many, the cadet corps is the natural successor to the scout troop. Without entering into the merits of this proposal, which raises issues too serious to be dealt with briefly, we may yet contend that military training is too

¹ See Ernest Young's article, 'Scouting—Its Educational Value,' in the *Report of the Conference on New Ideals in Education* for 1916.

narrow in its scope and aims to represent adequately what scout training does for the boy from twelve to fifteen years of age. The need is rather for sodalities on a basis wide enough to capture and develop all the new interests of adolescence. A summer camp, or something equivalent thereto, would probably be an essential feature in the activity of such organizations. Camp life would replace the imaginative basis of the boy scout stage with something demanding less making-believe, yet capable of stimulating in a similar way physical, social and moral culture; for instance, it could be used to preserve as a permanent element in education the tradition of national service established by the vacation work of schoolboys and college girls during the two great wars. In the winter months the natural aims of the associations would be to guide the play-impulses of their members into the channels of art—to encourage expression in music, the drama, craftsmanship, and the like—and to foster interest in matters of practical citizenship. Sodalties with some such aims as these will be, it may be urged, wellnigh indispensable adjuncts to part-time education in County Colleges, and should in some form be represented in or in connection with every school for older boys and girls.

The senior branch of the scouts, called Rovers, which came into being some time after the preceding paragraph first appeared (1920), has aims that accord well with those suggestions, and the idea expressed in the last sentence has since become the theme of much public discussion.¹ A more recent proposal that 'a four-weeks' voluntary training holiday, in mountain camp or sea school, should be agreed upon by school or by employer as the privilege of all youth,' and should be used, partly as an initiation into public service, but especially as an attempt to 'keep the chivalrous virtues alive without the stimulus of war' gives to the same ideas another concrete setting.² Realistic and adventurous training in mountaineering and seamanship was, in fact, the culmination of a novel scheme of physical training devised for a northern

¹ See A. E. Morgan, *Young Citizen*, 1943, Chs. VII to XI, and H. C. Dent, *Education in Transition*, 1944, Ch. III.

² It is quoted from a letter by G. Winthrop Young in *The Times* of February 2, 1944.

Scottish school and county and described in detail by the headmaster.¹

No candid observer can doubt that school teaching would be immensely more efficient if teachers could learn to exploit the intellectual energy released so abundantly in play. Sad witness to this truth is borne by the long list of writers, discoverers and men of action who have accused their school education of being useless, sometimes even hostile, to their development. And these men, whose intellectual force was great enough to bring their play-dreams to maturity, are only island-peaks standing out from a submerged continent of ability. School instruction, narrow, unimaginative and over formalized, was too often the direct cause of the submergence. It is not extravagant to say that if such losses are to be avoided teaching methods must aim deliberately at feeding the impulse to intellectual play. This does not mean that intellectual dissipation is to be encouraged or even tolerated, but that the child's impulses to experiment with life should be taken as our guide in teaching him. Following up Karl Groos's hint, we should take the child seriously, as he takes himself, as poet or dramatist, engineer, surveyor, chemist, astronomer, sailor, and should help him to explore as fully as he desires those concrete modes of self-assertion. We have seen that the boy scout training succeeds on its intellectual side precisely because it follows this policy; what is needed is in effect an extension of the same policy throughout the curriculum and, with due modification in method, throughout the school period.

The immediate question is, then, what form that policy should take as the social outlook of the youth succeeds to the individualism of the child and the age for overt making-believe is left behind. Our answer is that the pupil's studies should be so shaped as to help him to be, in imagination and in anticipation, a sharer in those phases of human effort which have most significance for civilization

¹ K. Hahn, *The County Badge or the Fourfold Achievement*, 1941. A short account is given in Morgan, *op. cit.*, p. 90. See also the (Norwood) Report on Curriculum and Examinations in Secondary Schools for suggestions that six months should be left free of examinations to enable boys and girls of 18 to give the period to work of national importance.

as a whole. His history and geography should look largely towards politics (in the wider sense) and economics; his science should make him a fellow-worker with men like Pasteur and the chemists and physicists who have transformed the material conditions of life; his mathematics should teach him the value of abstract thought in relation to the practical affairs of life, including the mechanism of commerce and the financial machinery of civic and national government. For teaching given in the spirit thus indicated makes as direct an appeal to the play motive in the adolescent as the invitation to make-believe does to the child.

Lastly, the same general argument gives powerful support to those who hold that the natural terminus of education is a training shaped to fit the young man or woman for some specific rôle in the great play of life. Here the imagination which roamed earlier over the whole field of human endeavour is centred upon a chosen plot. Interest comes to close grips with the details of actuality, and making-believe is present only in so far as the student antedates in imagination his entrance into the calling of his choice.

The reader may suppose that, having traced the make-believe element from its riotous beginnings in childhood to its sober appearance in vocational studies, we have fully explored its function in sustaining and facilitating spontaneity. The grown man and woman, he may say, have to face the bare facts of the world and wrestle with them without the magic aid of fancy. Fortunately, Nature is not so unkind as that. She does not withdraw altogether from the adult the power of making-believe with which she protected his tender years. A happy blindness of men to present reality has saved many a good cause in times of trouble, has preserved many a charming way of life, and prevented many a schemer for the world's good from abandoning his labours in despair.¹ And while it is often good for us to see ourselves as we really are, it may often be still better, both for ourselves and for others, that we are able to ignore our actual weakness and pettiness, and to take a make-believe

¹ A literary instance is Dr. Stockmann in Ibsen's play, *An Enemy of the People*. The character is said by the critics to 'depict Ibsen's own position towards his countrymen in the matter of *Ghosts*.'

self as the basis of our plans and actions. So subtle and pervasive, as we have said, is the spirit of play.

NOTES ON BOOKS, ETC.

The foregoing chapter is based on an article contributed to the *Educational Times* of November, 1912. For further references see the Notes at the end of Ch. VIII.

CHAPTER VIII

Freedom in Education

It is hardly extravagant to say that in the understanding of play lies the key to most of the practical problems of education ; for play, taken in the narrower sense as a phenomenon belonging especially to childhood, shows the creative impulses in their clearest, most vigorous and most typical form. Hence it is that essentially creative activities, such as art and craftsmanship, and, in a smaller measure, geographical exploration and scientific discovery, are felt to have a peculiar affinity with play and are, in fact, continuous with it in the development of individuality. Even recreative play and relaxation are misunderstood if viewed merely as attempts to escape from the burden and grind of real life ; whether the player be child or man, they express the craving of the organism for free self-assertion. All truly effective reform, both in education and society, is motivated by the desire to enlarge as much as possible the field in which that central function of life may find worthy and satisfying exercise. Its ideal, whether held consciously or unconsciously, is always that of the mad priest, in *John Bull's Other Island*, who dreamed of 'a commonwealth in which work is play and play is life : three in one and one in three.'¹

Stated in this provocative language the ideal is one which common sense may hesitate to approve. Developing a little further, however, the doctrine of the preceding chapter, let us note that the terms 'play' and 'work' both connote activities of widely differing worth. There is play which is merely a trivial means of consuming time, there is play with a definite educative virtue, and there is play which is full of high seriousness. There is a corresponding hierarchy among the forms of work ; not all *labor* is also *opus*. At the bottom of the scale there is senseless, brutalizing toil whose existence insults the name of work, at the upper end there are activities that ennoble the doer and may uplift a nation or the whole world of

¹ Quoted by A. N. Whitehead, who commends it as, in particular, 'the ideal of technical education.' See his *Organization of Thought* (Williams & Norgate, 1917), p. 30.

men. And the striking thing is that the characters which mark these highest kinds of work as just those which are essential to play; at their peaks the two hierarchies fuse and are one. By that we mean that the highest types of work are those in which the worker chooses his own task and sets his own strict standards of achievement: in a word, finds his divinely appointed opportunity of self-creation and self-expression. It can hardly be gainsaid that the highest type of school and the highest type of commonwealth would be a school, a commonwealth in which this kind of work, which is also play, prevailed.

The statement of the ideal would, in fact, cease to be provocative if for 'play' one substituted 'freedom' and, for 'work,' 'discipline'; yet its meaning would be little changed. For freedom and play are obviously twin sisters, and the kinship between work and discipline is almost as close. As before, we have two hierarchies of values. Freedom, understood as liberty to follow, unchecked, any whim of the moment, is of little or no value; its ugly synonym is licence. Similarly discipline at its lowest level—purely repressive discipline, whether in a barrack-yard or a class-room—is not only the polar opposite of freedom but may easily become a dangerous and corrupting thing. The higher values of freedom emerge only when it chooses worthy ends and in pursuing them submits itself to the control of well-inspired forms or methods. Thus the forms through which a great composer expresses his musical ideas or a great poet his imaginative view of the world are examples of the highest kind of disciplinary control; so far from being hindrances to the free efflorescence of genius they make possible the highest freedom it can gain.¹

The ideas set forth in the preceding paragraphs are no novelty in pedagogical thought, but have, since 1914, influenced as never before the trend of educational progress. A brilliant teacher of English wrote about them under the title of the 'play-way' in education,² but their rendering in terms of school life and classroom practice appears more often as a conviction that the best

¹ Cf. Goethe's lines:

'In der Beschränkung zeigt sich erst der Meister,
Und das Gesetz nur kann uns Freiheit geben.'

² H. Caldwell Cook, *The Play-Way* (Heinemann, 1917).

educational ways are those that offer, within a carefully chosen area, as much room as possible for individual freedom. Among the movements inspired by that conviction more or less directly, the one connected with the name of Maria Montessori has attracted, not undeservedly, world-wide attention. There is probably in the Montessori 'system,' as in all its predecessors, much that has only secondary importance and only temporary significance—possibly much that will not justify itself before the bar of experience. But these things can hardly be true of the cardinal feature of her teaching: her courageous and resolute attempt to throw upon the child as completely as possible the responsibility for his own education, and to reduce external interference with his development to a minimum. Man being a social animal, Montessori provides that her children shall learn how to live with others, to co-operate with them in work and play, to acquire social and personal graces. But the most characteristic part of her scheme consists in the devices—largely taking the form of 'didactic apparatus'—by which they are led to teach themselves what infancy and childhood should learn: such as the skilled use of their powers of movement and sensory discrimination, and the elementary arts of reading, writing and number. Left to themselves, under the supervision of the teacher or 'directrice,' to go their own way at their own time, to choose their own tasks and to be their own critics, the little students acquire, it is claimed, a high degree of initiative, self-reliance and power of concentration; they learn self-respect at the same time as respect for others, and develop a habit of serious, purposeful industry rarely shown by children driven abreast along the road of progress in accordance with the traditional method of class-instruction. And there is no reason to doubt the justice of these claims. Indeed the most cautious observer, if he could pass from a class of children recently released from the bondage of the older method to one that has learnt to use the new freedom, and could compare the noisy restlessness and aimless disorder of the former with the calm and happy self-guided industry of the latter, would find it hard to remain a sceptic.¹

¹ This sentence records observations made by the author during a visit to the infants' department of a London County Council School.

The Montessori system has had to face objections based not only upon

Although Montessori repudiates make-believe play, together with its literary reflection, the fairy story, the essence of her practice may, nevertheless, be described as the play-principle erected into a universal method for the education of young children. Methods of a similar character, though much less thorough-going and more limited in scope, have for years been applied to the teaching of older pupils in this country and in America. The best known is the 'heuristic method' of teaching science which, at the end of the last century, became in the hands of H. E. Armstrong a practicable instrument of instruction and, largely as the result of his advocacy, affected powerfully the teaching first of chemistry and physics and later of other subjects. Since the professed object of the method is to place the student as completely as may be in the position of an original investigator, wrestling for knowledge as the man of science wrestles, it is clearly in principle a play-method. For several reasons, the ceaseless growth of the curriculum being one, Armstrong's methods have fallen out of favour in schools of the grammar-school type; but there can be no doubt about the essential virtue of the heuristic principle, and modern teaching would be seriously impoverished if its influence were not preserved in forms suitable to the present educational situation. In post-primary schools whose curriculum is not cramped by external examinations there is a suitable place for heuristic methods in all kinds of 'nature-study,' including gardening and simple observational astronomy. Another important innovation, Helen Parkhurst's 'Dalton Plan' (so named from a school in the United States) does not challenge the conventional curriculum but, wherever possible, would replace class-

a distrust of the freedom-principle that now seems antiquated but also upon criticisms of the didactic apparatus and the use made of it. For instance, it is said (Wm. Stern) that the training given by the exercises is one-sidedly intellectual, and by concentrating upon isolated psychological factors, such as colours, forms and tones, fails to follow and develop the natural movements of the infant mind. Another line of criticism (Sergius Hessen) maintains that the system, breathing the spirit of the psychological laboratory, ignores the true philosophy of children's play. A third critic (Ed. Spranger) deplores the lack of the fantasy-play that leads the child towards a conception of the actual world. For these criticisms and a vigorous reply to them, see K. Gerhards, *Zur Beurteilung der Montessori-Pädagogik* (Leipzig, Quelle & Mayer, 1928).

teaching by free individual study unregulated by a time-table. In brief, it would extend to all classes of a school a method long current in English schools where the most advanced pupils are left to forge ahead in their studies at their own rate, receiving from their teachers general guidance and supervision, help when needed, but only occasional formal instruction. Thus the Plan involves an elaborate system of 'assignments' prescribing the ground to be covered in each subject during a given period, and giving necessary information about it and hints of procedure. Speaking generally, the pupils are left to carry out the assignments, privately or in groups, as and when they please, being brought together for class-instruction only when the special nature of the subject demands it. In a large school the Plan brings complexities and difficulties that have led to its being abandoned or at least greatly diluted in many places where it was once adopted with enthusiasm. But it is still followed, with minor adaptations, in some large and important schools, and its influence appears in numberless others in an increased emphasis upon the value attached to individual effort and initiative in school studies in contrast with the exaggerated importance formerly given to corporate teaching.

The movements just outlined apply the freedom-principle in the field of teaching and study; beside them is to be placed another series of essays in revolutionary pedagogy, whose significance is rather in relation to school government and discipline. Here for a while the chief centre of inspiration, at least for this country, was Homer Lane's 'Little Commonwealth,' which was, in turn, a derivative from an American institution widely known as the 'George Junior Republic.' The original citizens of the Little Commonwealth were, like their transatlantic prototypes, young delinquents, boys and girls of fourteen years and upwards, who were handed over to Lane, under the terms of the Children Act (1908), by a discerning and courageous magistrate. It is, however, instructive to observe that the community, as it grew, came to contain a number of children, of tender years and innocent of crime, whose presence was valued as an important factor in the remedial influence of the institution. The prime feature of Lane's policy was one that struck every newly enrolled member of the Commonwealth with extreme astonishment—namely, that the citizens were

subject to no discipline or government which was not of their own making and administered entirely by themselves. They regulated their affairs with all the freedom and self-responsibility of a fully emancipated democracy.

The argument that led up to this startling inversion of the usual methods of the 'reformatory school' is clear and simple. In Lane's view, juvenile criminality is due not to a perverted nature but to the misdirection of strong impulses which, deprived of their normal outlet, are driven to seek satisfaction in irregular and anti-social conduct. The remedy sanctioned by psychology is not further repression, relentless and overwhelming, but 'sublimation'; and this is the remedy the Little Commonwealth sought to supply. The young incorrigible, the despair of his parents and teachers, perhaps the terror of a London slum, found himself on a farm in Dorsetshire among busy young people engaged in occupations that tempt initiative and give scope to abounding energy. If he chose to share their labours he could earn the wages of independence; if he declined to work he must live on the humiliating charity of boys and girls of his own age and class, and admit the justice of their contempt. There was little fun in rebellion against the law, where there was no authority except the common will of those who might in former days have been members of his own 'gang.' It should not be surprising that, in these circumstances, the inveterate truant and idler was often transformed into an industrious agriculturist, the young outlaw into a convinced supporter of a social order he helped to make.

The ideas of Montessori, Parkhurst and Lane have been described at some length because they, together with the older principle of heuristic study, have been widely influential. In this as in other countries after the great social and spiritual upheaval of the war of 1914-18, they challenged the older educational traditions and tended to give a new orientation to methods of teaching and school government. It would be extravagant to say that this movement captured the schools, an exaggeration to say that it has on any large scale broken down the old conventions; yet it cannot be denied that its influence has permeated even where its apostles have been condemned. Expressed in broad terms, the principles of the movement are that the old authoritarian attitude of parents and teachers should

be modified, that more responsibility for their conduct and progress in school studies should be entrusted to the children themselves, that methods of instruction should be made more flexible so as to meet better the widely differing needs of individuals, and that more account should be taken of varying tastes and abilities. In a word, it is a movement to exploit more fully than heretofore that spontaneity of the individual which we have described as the essence of play. It has in many cases linked itself with movements to reform the matter as well as the methods of teaching, to give greater scope to children's creative powers, to bring school work into more direct and fruitful touch with the doings and interests of the wider world, and so on; but these impulses towards the reform of the curriculum, though they find a natural place in the movement we have in view, are hardly an essential part of it.

We cannot enter here into particulars of these departures from the old tradition; for they have become numerous and appear in many variants in most civilized countries.¹ Some represent a mild revolt and have been safely followed in schools where circumstances forbade bolder action; others are the adventures of 'wilder comrades' who have turned their backs completely² upon the older ways. It was to be expected that the more heroic experiments should, as a rule, have a rather short life; but it does not follow that steadier-going teachers may not have learnt a good deal from them. And as a matter of fact though, during the years after 1918, the social temperature which favoured educational adventure cooled perceptibly, the deeds of the *sans-culottes* have, as we have said, not

¹ A list of works bearing on the subject is given at the end of the chapter.

² Or nearly completely. The recent discovery that children 'evacuated' from slum homes in the great cities may be utterly lacking in decencies we expect even our domestic pets to observe gave a great shock to uninformed opinion. (For some details see H. C. Dent, *Education in Transition*, 1944. Ch. I.) No reforming zeal could go so far as to accept such a state of things and abstain from interfering with it. It showed only too clearly that civilized behaviour is not a gift of nature but needs often to be taught. The question is where, in practice, the line is to be drawn between direct teaching and the child's discovery of the value of a moral order by free experimentation, adequately supervised.

failed to influence the aims and course of normal educational work.

In connection with these new departures in education two large questions arise. The first is the question of school organization ; the second concerns the functions of the teacher.

It is manifest that neither a rigid class-system nor a rigid timetable is wholly compatible with the principle that a child should travel through the world of learning in his own way and at his own time. These institutions embody, in fact, the contrary principle ; for the assumption underlying them is that a school may be divided into groups of learners each of which can be treated as a unit moving in a single direction at a single rate of progress and transferring its interest from subject to subject in obedience to an external rule. In the case of the large classes still too common in many schools, this grotesque assumption has often to be taken quite seriously, for nothing else may be possible. In less trying cases there is room for compromise ; classes may be subdivided into sections and rearranged for different subjects ; there are ' options ' and ' sides ' and ' individual attention ' for divergents. But although the barbarous simplicity of the scheme may thus be tempered, its basis is still the postulate that it is the teacher's business to prescribe what shall be learnt and how and when it shall be learnt, the pupil's to respond as best he can. The ' Montessori school,' on the other hand, accepts the full consequences of the principle that the individual pupil is the unit. Life being a social business and the school a miniature society, there must be certain regularities and certain corporate acts. Apart from these, however, there is no fixed timetable and there are no classes ; the children go their own way and move freely upon their lawful occasions. In the case of older pupils this method, too, must admit compromise. There are many times when the repetition of necessary instruction would be extremely wasteful, and many when corporate teaching has values of its own which nothing could replace. Moreover, provision must be made for co-operative activities, such as music, gardening, field-work, and hand-work, physical and dramatic exercises. For work of these kinds there must be fixed times, places and organization. But there would remain an unmistakable difference between the

general tone and functioning of a system of this kind, and those of one built up on the traditional presuppositions. And there is already good evidence that such a system is not only practicable, but is capable of yielding fruits better than those of the older system, even when measured by the older standards.

Lastly, we turn to the teacher. The reader may have found it difficult to see what room is left for a teacher in a scheme of things in which each child is to seek his own individuality and ensue it. And his perplexity may well be deepened when he finds Montessori insisting that the teacher's one function is to be 'an observer.' Let him note, then, in the first place, that however 'natural' the conditions of school life may be made, it remains a life lived in a selected environment, an artificial microcosm within the macrocosm, and that the teachers do the selecting. They set the stage and furnish the properties for the play. It follows that even though they claim no share in the composition of the drama, but merely watch its development with friendly interest, they have already settled within certain limits what form the action shall take. Thus, though it is true that in a Montessori school a child may do what he pleases, yet what he may please to do is rigidly and even narrowly limited. He must fit cylinders into their appropriate holes, arrange coloured tablets in due sequence, learn the rudiments of number from the 'long stair'; for, as matters are arranged, there is really nothing else he can do. In fact, one of the most striking things about these schools is the uniformity of the routine. Of all the uses to which infantile ingenuity could put the 'didactic apparatus,' those intended by the inventor are the only ones actually observable. How does this come about? Ultimately, without question, by the will of the teacher, who intends, for instance, that the cylinders shall be used neither as ninepins nor as soldiers, but solely for cultivating tactile and visual discrimination. This use, discreetly suggested, spreads by imitation and becomes fixed in the tradition of the school; but behind and safeguarding the tradition there is always the abiding will of the teacher.

It must, further, be understood that, in speaking of the teacher as an observer, Montessori has in view not a merely passive onlooker, but an active observer—one who 'stands by,' in the nautical sense of the term, refraining from fussy interference, but ready to lend a

hand when help is called for. She must keep a minute record of each child's progress and, like a watchful but restrained mother, must look for the moment when a word will be truly in season or a suggestion judicious.

Similarly, the teacher of older pupils will not cease to be a teacher, however resolutely he may abjure the didactic attitude. His functions may change in character, but will be no whit less important, and will make even greater demands upon learning, intelligence and professional cunning. It will be his task to create and maintain an environment in which his pupil's impulses towards the arts and sciences will be awakened and to shepherd them unobtrusively in the right directions. Himself steeped in the best traditions of his subject, he must see that, by inspiration, suggestion and criticism, those traditions are revealed to the young inquirer, and are allowed to make their appeal to him. He will be an 'idea-carrier' between the great world and the school microcosm, infecting his pupils imperceptibly with germs that may fructify into ideals of sound workmanship and devoted labour. And, as we have already said, organization and corporate instruction, though they lose their obstructive predominance, must retain their natural place in the school economy. The old pedagogic arts, which represent not merely the blunders of the past but also the successes won during centuries of sincere and patient effort, can never become obsolete. But purged by a surer criticism, they should develop into the better instruments of a more enlightened purpose.

Turning from intellectual to moral education, we must remark that some enthusiasts for the 'new freedom' are prone to accept with uncritical readiness the doctrine that children are naturally good, in the sense that if they were left to themselves moral beauty would unfold in their lives, as surely as physical beauty unfolds in the blossoming flower. It is a pleasanter doctrine than the one which declares the heart of man to be deceitful beyond all things and desperately wicked, but, like the latter, is rather the expression of a temperament than the statement of a fact. For instance, Freud's psychoanalytic work convinced him that 'sadism'—the impulse that aims at inflicting pain and injury—is a normal component of human nature, often associated with ungoverned sexuality. Unspeakable atrocities perpetrated on a vast scale by the forces of

aggression during the world war make it difficult to doubt the truth of this unpleasing picture of our darker depths.¹ There is, nevertheless, this to be said for Rousseau's position as against Jeremiah's : good ways of life have in them a promise of growth which bad ways may falsely offer but cannot, like the good, fulfil. Good activities may lead to indefinite expansion ; evil activities, though for a while they may flourish like the bay-tree, contain in themselves the seeds of their own inevitable decay.² Beings, the deepest need of whose nature is creative expansion, must, therefore, on the whole, seek the good and cannot be satisfied unless they find it. But the tragic history of the human conscience, and the sad story of what man has made of man, show how doubtful is the search and how often it ends in disaster. While, then, the unperverted impulses of childhood may have a biological bias towards the good, it is too much to expect them to solve unaided the problems of life which have baffled some of the best-intentioned minds and most highly gifted races of mankind. In short, it is dangerous to ignore either of two

¹ Innate sadism may be 'sublimated' into the aggressive zeal of a social reformer who has little regard for the feelings of his victims ; or it may actually be transformed into a kindness of disposition which is a 'reaction' aiming at the repression of impulses abhorrent to the educated conscience. Some psychologists hold, also, that sadistic impulses may be 'worked off' in hunting and other sports of an aggressive nature. J. Dover Wilson's remark (*The Essential Shakespeare*, 1932, p. 123) that 'the human devil [Iago] who delights in contemplating the writhings of a tortured spirit is a part of Shakespeare himself,' suggests another interpretation of the same kind.

² Cf. A. N. Whitehead, *Religion in the Making*, p. 83 : 'The fact of the instability of evil is the moral order of the world.' For a less optimistic view, see K. Mannheim, *Man and Society*, p. 51 : 'Philosophers and sociologists once thought that there was a tendency towards rational and moral progress inherent in the human mind. That this is untrue is clear to every one who knows what is happening in the contemporary world, for it can be asserted with confidence that in the last decades we have receded rather than advanced as far as moral and rational progress is concerned.' This condemnation of the age seems to be too sweeping ; for it has seen not only an attempt to impose upon the modern world the ancient rule of violence, backed by the pitiless use of the latest inventions of science, but also the remarkable stirring of conscience to which the immense actual and prospective development of 'social services' bears witness. Which of these movements is destined to give the prevailing colour to the next age ?

complementary truths: the one expressed in Shelley's bitter parody, 'Wherever two or three are gathered together, the devil is in the midst of them'; the other in G. K. Chesterton's dictum, that to hold that 'salvation, like other good things, must not come from outside' is 'a blunder about the very nature of life.'¹

In the realm of conduct, then, as in the realm of intellect, teaching must always have a definite place and essential functions. Taking first the case of young children,² it is clear that the teacher's manipulation of the environment is not limited to setting the stage for the child's activities and providing him with fellow-actors. She, with her superior powers and knowledge and her developed personality, is herself a constant and most important element in the environment, and exercises on the growing minds about her an influence that will be none the less decisive because it is brought to bear in the indirect form of suggestion and example rather than by precept and command. From her, if she is worthy of her functions, the children learn in a thousand subtle ways the attitudes and tendencies that distinguish the humane from the brutal, the civilized from the barbaric habit of life. Insensibly but surely her values become their values, her standards their standards; and from her come the influences that direct the children's social impulses into definite forms of kindly action.

Similarly, although the teacher of older boys and girls may resolutely put away the notion, so seductive to adult vanity, that it is his duty to 'mould the characters' of his pupils as the potter moulds his clay, yet he cannot bind the directive influences that flow from the prestige of age, of superior knowledge and experience of the world. Even if he could he should certainly not do so. His part is not to be a *roi fainéant*, but rather to be in his little republic a perpetual president, who must exercise the duties of citizenship all the more scrupulously and assiduously by reason of the exceptional powers his position gives him. He cannot help regulating the moral atmosphere of the school or class to a large extent by his influence on the pupils' studies and reading. And though his young people will generally gain outside the school their first

¹ *Short History of England*, p. 58.

² See Susan Isaacs, 'The Function of the School for the Young Child' (*The Forum of Education*, June, 1927).

acquaintance with the loyalties and aspirations that divide and sway the world, yet it is in school and under his influence that the issues involved in those loyalties and the meaning of those aspirations should become clear to them, so that they may make their choice with as full a sense of responsibility as their age permits.

Again, it is undoubtedly a sound principle that the power of moral ideas depends, in general, upon their being learnt from first-hand experience, and used as guides to one's own responsible actions. Here, rather than in some metaphysical dogma of natural goodness, is the true sanction for the practice of throwing the onus of school-government—so far as it is feasible—upon the governed. The principle is so important that, rather than sacrifice it, a teacher may justifiably tolerate much minor evil, waiting patiently for the spontaneous reaction that will generally come when experience reveals its unpleasant fruits. But, in addition to the common rights of school citizenship that the teacher shares with the taught, he has a special responsibility which he cannot repudiate: it is his plain duty to see that the fundamental purposes of school-life are not frustrated by the corrupting influences of a few or the moral weakness of the rest. When danger of this kind threatens, and persuasion fails to 'rally the good in the depths' of the social body, he must act and act decisively. There is no inconsistency between this conclusion and the preceding argument, provided that the teacher makes clear that he acts not as an autocrat resuming rights of interference for a while in abeyance, but as the mandatory of a wider society to which he and the offending body alike owe allegiance—the school as an historic entity transcending its present membership, or, in the last resort, the Great Society of which the school is, ultimately, an organ.

NOTES ON BOOKS, ETC.

W. BOYD has edited *Towards a New Education* (Knopf, 1930), a review of discussions and addresses at an International Conference of the 'New Education Fellowship' which gives a bird's-eye view of the movement in many countries. The organ of the N.E.F. is *The New Era*, published at 11, Tavistock Square, London, W.C.1. In *The Cult of Uncertainty* (Macmillan, 1943), I. L. KANDEL includes an incisive criticism of some of these movements in a broad and illuminating study of educational aims and methods. H. C. DENT, *Education in Transition* (Kegan Paul, 1944),

ends with an informative description of the educational ' ferment ' produced by the events and experiences of the war-years. Typical books on the new movement are : EDMOND HOLMES, *What Is and What Might Be* (Constable, 1911) ; H. RUGG and A. SHUMAKER, *The Child-centred School* (Harrap, 1929) ; A. FERRIÈRE, *The Activity School* (Eng. trans., Allen & Unwin, 1929) ; A. HAMAÏDE, *The Decroly Class* (Eng. trans., Dent, 1925) ; B. RUSSELL, *On Education, especially in Early Childhood* (Allen & Unwin, 1926). For methods of individual as opposed to class study there are : MARIA MONTESSORI, *The Montessori Method* (1912), and *The Advanced Montessori Method* (1917, both Heinemann) ; H. PARKHURST, *The Dalton Plan* (Bell, 1922) ; A. J. LYNCH, *Individual Work and the Dalton Plan* (Philip, 1924) ; N. MACMUNN, *The Child's Path to Freedom* (Mem. ed., Curwen, 1927) ; G. H. THOMSON, *A Modern Philosophy of Education* (see p. 41, for ' Winetka Plan ') (Allen & Unwin, 1929) ; *The 24th Yearbook of the [American] National Society for the Study of Education*, Pt. II, contains a valuable critical review of the principles of the Dalton and Winetka plans, etc., by W. H. KILPATRICK (Pub. Schl. Pub. Co., Bloomington, Illinois, 1925) ; H. CALDWELL COOK, *The Play-Way* (mainly for English, Heinemann, 1917). For self-government in schools see : E. T. BAZELEY, *Homer Lane and the Little Commonwealth* (Allen & Unwin, 1928) ; J. H. SIMPSON, *An Adventure in Education* (Sidgwick & Jackson, 1917) ; E. A. CRADDOCK, *The Class-Room Republic* (Black, 1920). For the Caldecott Community see : CLARKE HALL, *The State and the Child* (Headley, 1917). LORD BADEN-POWELL, *Scouting for Boys* and the official handbooks for Wolf Cubs and Girl Guides are published by C. A. Pearson.

CHAPTER IX

*Nature and Nurture*¹

The question of the relative importance of what a child can do for his own education and what he may derive from his teachers has been long and warmly debated in a more general form—namely, as the question whether ‘nature’ or ‘nurture,’ inherited endowment or environmental influence, has the more potent effect in determining a child’s development.

The highest claims on behalf of the potency of nurture are those made by the French thinker Helvétius (1715–71), whose cheerful creed is summarized in the aphorism, *L’Éducation peut tout*. In sharpest opposition to his school stand Francis Galton and those who, following him, have created the modern science of eugenics.

In his posthumous work, *De l’Homme, de ses Facultés intellectuelles, et de son Éducation* (1776), Helvétius inquires why men differ so widely in abilities, tastes and character, and concludes that all these inequalities are due to a single cause—namely, differences in education. This explanation, enforced with unflinching courage through two longish volumes, is based upon John Locke’s doctrine that all ideas come into the mind by way of the senses. If two persons could, from the first dawn of sensibility, be made to receive exactly the same sensations, their minds would, he argues, become and remain identical. But in actual life the experiment would be impossible; hence the differences which distinguish every mind in a greater or less degree from every other. The argument applies to character as well as to intellect. Man is not born good, as Monsieur Rousseau had maintained so eloquently in his *Émile*, nor is he born evil; virtues and vices are all the fruit of education

¹ The distinction intended by these terms was made by Shakespeare’s Prospero, who spoke of Caliban as

‘A devil, a born devil, on whose nature
Nurture can never stick.’

(*The Tempest*, IV, i.)

Francis Galton introduced it into modern discussions in his *Inquiries into Human Faculty*, 1883.

grafted upon self-love, and self-love, being rooted in physical sensibility is therefore common to all.

Amidst the degradation brought about by the Industrial Revolution, Robert Owen (1771-1858), pioneer of socialism and of the co-operative movement, in his *New View of Society* (1813),¹ preached in a less paradoxical form what is in essence the same gospel. Man, he maintains, never did nor ever can form either his own opinions or his own character; both are the inevitable results of what has been impressed on his mind by his predecessors and the circumstances which surround him. It follows that 'any character, from the best to the worst, from the most ignorant to the most enlightened, may be given to any community, even to the world at large, by the application of the proper means'; and those means are education, understood in a sufficiently wide sense.²

Owen, unlike Helvétius, sought to carry his precepts into practice; and the record of his heroic struggle to bring about the moral regeneration of a Scottish manufacturing village is one of considerable success, aided by brilliant intuitions of sound methods in education and the fostering of 'social welfare,' but frustrated in the end by the failure of his age to understand his ideas.

In contrast with the tendency of such optimists as Helvétius and Owen, that of the Galtonian school is to exalt nature so high that nurture appears to have but trivial importance. They base their position mainly upon the stubborn facts of heredity. Galton presented some of these in a particularly arresting form in his nightmare histories of twins who behaved throughout their lives as if they were clockwork automata turned out by the same factory and wound up at the same moment. The disquieting inference

¹ Reprinted in Everyman's Library, 1927. See also G. D. H. Cole, *Life of Robert Owen* (Benn, 1925).

² James Mill, in his article on Education in the *Encyc. Brit. Supplement* (1818), expresses the same opinion with more reserve: 'This much, at any rate, is ascertained, that all the differences which exist, or can ever be made to exist, between one class of men and another, are wholly owing to education.' With regard to the sweeping claims made by Helvétius, his view is that 'Enough is ascertained to prove, beyond a doubt, that if education does not perform everything, there is hardly anything that it does not perform.' See F. A. Cavenagh, *James and John Stuart Mill on Education* (Cambridge Univ. Press, 1930).

from these chronicles and more recent ones of the same kind is that we are all driven upon life's course by the fatal *vis a tergo* of our endowment, although, owing to the merciful infrequency of twins, most of us are able to dwell in a fool's paradise where the depressing fact may be ignored.¹ The biometricians have used their statistics ruthlessly to drive home the same idea, showing that a man's character is correlated with his ancestors' as fatally as his stature or his cephalic index. And, finally, eugenic research has rooted out the appalling history of the Jukes family,² and similar dismal records to clinch the proof that the circumstances of life are to man what rocks and winds and currents are to a ship: merely accidents that make his qualities manifest but have nothing whatever to do with producing them.

The opposition between the Helvetian and the Galtonian doctrines is unmistakable, and we should be in an uncomfortable position if we were compelled to adopt either of them to the exclusion of the other. But, as often happens, the actual problem is not to choose one of the horns of a dilemma but to decide how much two distinct influences contribute to human development. That problem appears more difficult the closer psychologists come to the observable facts of mental growth. It has, for instance, been commonly assumed that 'juvenile delinquents' are nearly always the victims of a vicious endowment; but modern inquiries, made with due regard to the statistical proprieties, do not confirm this view; they show, rather, how entangled the influences are that produce the young criminal. It is true that out of 4,000 boys (a selection from 22,000) who had been received into Wormwood Scrubs Prison, Dr. W. N. East found 4 per cent. to be mentally defective—a proportion far

¹ But some comfort may be derived from Blatz's careful study of the celebrated Dionne quintuplets. For he writes: 'It has been startling to record that the differences in the individualities of these five children are diverging more and more. In their fourth year of life they show personality differences so well defined that the latter cannot be considered dependent upon biological inheritance, in which all five children are markedly similar.' (W. E. Blatz, *The Five Sisters*, 1938, p. 173.)

² Out of about 1,000 persons in five generations, 300 died in infancy; 310 spent 2,300 years in almshouses; 440 were wrecked by disease; 130 were convicted criminals (including 7 murderers); and only 20 learned a trade! See Keatinge, *Studies in Education*, p. 27.

higher than in the general population ; but in other respects hereditary factors, though present, appeared to play a minor part in the story. Home conditions proved to be of supreme importance—excessive size of families ; quarrelsome parents ; prolonged absence of a father or of an elder brother or sister ; lax, careless or repressive discipline ; the removal of the boy from all home influences ; and so on. Contrary, perhaps, to expectation, total unemployment among the delinquents was not above the normal amount. On the other hand it seems probable that the teaching they received at school was often unsuitable to their temperamental type—failing to distinguish between the more passive boys who need chiefly kind guidance and the more aggressive who need strict ‘custodial supervision.’¹ The records of such institutions as the Barnardo Homes point in the same direction as East’s scientific analyses ; for they tend to show that the most unpromising stock, when properly nurtured, may yield good and sound human materials.

Such studies and observations as these show that the Galtonian view underestimates the rôle of ‘social heredity’ in enabling innate ability to express itself, and so tends towards a pessimistic view of the possibilities of average humanity. Medical psychologists, and other observers whose work brought them into intimate contact with the minds of private soldiers during the war of 1914–18, were often struck by the immense amount of talent which an unenlightened education and a depressing social system had conspired to inhibit.² And there is good evidence that what is certainly true of our own people is also true of many of the ‘backward peoples.’ For instance, from the fact that the Murray Islanders had no words for counting beyond six and could refer to larger numbers only in the vaguest way, it seemed a fair inference that their nature lacked the conditions of mathematical ability. Yet under the ministrations of a Scottish dominie their children are said to have developed a

¹ W. Norwood East, *The Adolescent Criminal* (J. & A. Churchill, 1942). The above paragraph is based on the quotations and comments of Cyril Burt in his review of this book in *Nature* for September 26, 1942. Cf. also *The Young Delinquent*, pp. 599, 607.

² Cf. Pascal : ‘A mesure qu’on a plus d’esprit, on trouve qu’il y a plus d’hommes originaux.’

virtuosity in arithmetic that would have delighted any school inspector of the old regime.¹

On the other hand, the too easy optimism of the Helvetian School² leads them to underestimate the differences in general and specific capacity that limit the possibilities of individuals with adamant rigour. Inspired by a worthy but rather crude belief in the 'power of ideas,' they think of the soul as an artifact that may be fashioned, by a sufficiently skilful treatment, in accordance with almost any preconceived plan. Writers of this school are, therefore, only consistent in treating with marked coolness the idea that to cultivate individuality is the proper aim of education. Their attitude, which minimizes the influence of native capacity, would, if translated into practice, lead to much educational waste and, in particular, to what a great American democrat has condemned as the grave fault of 'democratic' education—namely neglect of the intellectual élite whom a wise nation would seek out in all classes of society and, when found, would cultivate to the height of their gifts and powers.³ There is no doubt that persistent educational pressure may alter the intellectual and spiritual orientation of a whole people. The modernization of Japan is usually quoted as the leading case, though Benjamin Kidd has proved to be right in declaring (in 1902) that the 'Prussianization of Germany,' effected in a generation very largely by the influence of the schools, was the most portentous instance. He did not foresee that, by a horrible inversion of his doctrine, Germany was, in effect, to prove him right in maintaining also that if the schools worked together in the proper direction they might, in twenty-five years, purge Europe of some of the worst evils that have tormented its history. But this permeation of a society by certain ideas, although enormously important, is but the beginning of education as we conceive it; for it is, after all, only the provision of an environment. The arguments in favour of giving

¹ The question raised here has special importance in connection with the African peoples. For a well-informed yet optimistic estimate of their possibilities, see Guggisberg and Fraser, *The Future of the Negro* (Student Christian Movement Press, 1929).

² Including the neo-Herbertians, of whom F. H. Hayward is a vigorous representative (see p. 78).

³ The Russian 'Suvarov Schools' appear to be a remarkable experiment in this direction.

the individual free scope to make his own use of the environment come subsequently into play and still retain all their force. For these arguments assert that the human organism, body and mind, is a centre of creative energy that uses endowment and environment as its working material ; so that the elements it receives from nature and nurture do not make it what it becomes, except in so far as they are the bases of the free activity that is the essential fact of its existence.

Accepting, as we must, the position that variations in native capacity cannot be ignored, we must next inquire what forms they take and how they can be estimated. Here we enter upon one of the most important chapters of recent psychology. The first episode centres upon the attempt of the French psychologist, Alfred Binet, to determine a 'metric scale of intelligence.' The starting-point of his researches was a problem of painful interest to administrators in most great cities—namely, to determine whether the backwardness that so often makes it impossible for a child to keep pace with others of the same age is, in a given case, due to mental defect or merely to unfavourable conditions, such as constant removal from school to school. Binet began with the hypothesis that every child has a definite fund of native capacity or intelligence that would carry him, even if he received no teaching, a certain distance forward during each of the formative years of life.¹ There is, for example, a time in the life of each child at which he has 'picked up' the facts that he has eyes, ears and a nose ; a time when he knows the names and order of the days of the week ; a time when he can carry in his head instructions of a certain complexity ; a time when he can disentangle the right conclusion from the data of a certain kind of argument, and can see through a certain kind of fallacy ; and so on. The psychologist sought, by examining a large number of young Parisians, to determine which of such non-scholastic accomplishments belong, on the average, to the several years of childhood. The list, once compiled, was to serve as a metric scale for fixing the 'mental age' of any child to whom it was

¹ This growth in native powers, in relative independence of outer influences, is called by psychologists 'maturation.' See Sandiford, p. 373, and references, for discussions of the curve of growth.

applied.¹ Thus, if a child, born ten years ago, could just pass the tests of the tenth group, his 'mental' would be deemed identical with his 'chronological' age; if he failed to deal with those beyond the eighth group, his mental age would be judged to be eight—*i.e.*, two years behind his chronological age. It remained only to decide what degree of retardation of the mental behind the chronological age made it impracticable to teach a child together with his coevals, and warranted his removal to a special school. Binet ultimately adopted as his criterion a retardation of three years for children over eight years of age and of two years for those below that age.

Since 1895, when Binet began his researches in this province, the use of his tests, and of others suggested by them, has been greatly developed and extended. The tests are no longer confined to their original purpose of detecting mental deficiency, being now employed to diagnose ability of all grades and for many purposes. Many of the tests which the psychologist has devised are concerned to do with greater scientific accuracy what teachers and school examiners have been doing for years—namely, assess progress in the various subjects of the school curriculum. Others are concerned with the problem with which Binet started—namely, to assess inborn capacity apart from actual attainments. A boy, for instance, who can read Xenophon or solve quadratic equations must possess the capacity to learn these things or he could not have learnt them; what is required of the psychologist's tests is that they shall predict that capacity before the schoolmaster sets to work upon him. There is a theoretical impossibility here, for capacity cannot be disclosed *in vacuo*; it can be made evident only by attainments of *some* kind. In practice, however, the psychologist gets over that apparently insuperable difficulty (i) by measuring the boy's attainments in fields where what he knows or can do has been influenced as little as possible by teaching, and (ii) by choosing for that purpose fields in which success and failure are believed to be prognostic of success and failure elsewhere. For instance, schooling has little or nothing to do with a child's ability to state correctly the opposite of 'poor'

¹ It may be noted here that mental age rarely increases beyond fourteen. The meaning of this is that by that chronological age we have, as a rule, 'realized' the whole of the potential mental powers with which we were born. But we may put them to indefinitely great use.

or 'enemy'; to complete the analogy 'sailor is to soldier as navy is to . . .'; to delete the three wrong words in 'most motor-cars are driven by wind, steam, petrol, gas'; or, given that three boys are sitting in a row, that Harry is to the left of Willie and George to the left of Harry, to say which boy is in the middle.¹ Yet there is abundant evidence to show that a child who can do things of this kind well is likely also to do well in any field in which good intellectual capacity is needed, and that a duffer here is likely to prove a duffer elsewhere.

The value of mental tests, already well known to psychologists, received an immense public advertisement during the War of 1914-18, when they were applied to about a million and a half recruits in the American Army, with the object of adjusting their military employment to their mental powers. Each recruit was required to answer, by underlining, crossing out or checking, a paper of 212 questions. The process took only fifty minutes, could be applied at one time to groups as large as 500, and furnished estimates that agreed most impressively with the subsequent judgments of the officers who had the same men under observation.

In Britain the War Office has recently instituted a Department of Personnel Selection, with a staff of over 1,000 men and women (largely drawn from the ranks of teachers) who, by means of standardized tests and other devices, assess the intelligence, special aptitudes, knowledge and skill of men and women recruited for

¹ These tests are quoted from Burt, *Mental and Scholastic Tests*. It will be observed that, general as they are in character, their comprehension implies a certain linguistic training in which some children, although intelligent by nature, might be lacking. These would include deaf children and those belonging to classes (e.g., canal-boat children) who are cut off by circumstances from association with educated people. For such cases 'performance tests' have been devised in which the use of gestures, diagrams and drawings replaces language, mechanical puzzles are to be solved, the constituents of a structure such as a mouse-trap are "to be assembled, etc. (See F. Gaw, 'A Study of Performance Tests' in *Brit. Journ. of Psych.*, April, 1925.) These tests have been used to discover how far, if at all, deaf children are below the normal in native intelligence. See Drever and Collins, *Performance Tests for Intelligence* (Oliver & Boyd, 1928); also G. H. Thomson, *Performance Test Scores of Scottish Children* (Univ. of London Press, 1940), which gives a careful statistical comparison of the results of verbal and non-verbal tests.

military service. Intelligence tests have been increasingly employed as supplementary tests in connection with the award of scholarships,¹ and, some years ago, were introduced, it is understood with satisfactory results, into certain examinations for posts in the Civil Service.²

It would be beyond our province to enter here into the details of mental testing, and we must be content to set down one or two points of general interest. The first concerns the manner in which the tests are administered. Binet's method was to apply them to children taken one by one. The individual remains the best method of testing children; but it clearly involves the expenditure of much time. In order, therefore, to test large numbers of persons with reasonable speed, 'group tests' are now employed. The tests quoted on p. 119, those used in the American Army and those employed in the Civil Service examinations, are examples of group tests. The second point concerns the manner in which the results of a test are expressed. Here Binet's lead is still followed; that is to say, if a child (no matter what his actual age may be) achieves

¹ The County of Northumberland must receive due credit for a bolder policy. In 1921 the authority commissioned G. H. Thomson to select by mental tests twenty children to receive scholarships—these awards being additional to and independent of those given on the results of the orthodox examination, and to be open only to schools which had not competed in that examination. Thomson's tests indicated that there were, in the small schools of the remoter rural districts, many children of superior ability who were precluded from winning the ordinary scholarships by the difficulties of their situation. He found, in fact, that the highest ability either clung close to the cities or lurked in far districts, such as the Cheviots. In 1926 J. F. Duff commenced a 'follow-up' inquiry into the subsequent educational and vocational history of these children (and of others selected later), and compared it with that of the children judged by the tests to be less intelligent. The results were very definitely favourable to the claims made for mental tests. See *Brit. Journ. of Psych.*: G. H. Thomson, 'The Northumberland Mental Tests,' Dec., 1921, and J. F. Duff, 'Children of High Intelligence,' April, 1929.

² 'Some 40,000 candidates have been tested in this way. And the calculated correlations demonstrate that the results of the new methods agree, both with the total marks from the whole examination and with subsequent reports on office-efficiency received from Government departments, more closely than any other single paper set' (C. Burt, *Mental Differences between Individuals*, 1923).

a result which is the average result obtained by children of age 5, or age 8, or age 11, then he is said to have a 'mental age' of 5 or of 8 or of 11 as the case may be. But the investigator now proceeds to divide the child's mental age by his actual or chronological age, and announces the quotient as his 'intelligence quotient' ('I.Q.') or 'mental ratio.' Thus the score obtained by a child of actual age 10 may show that his mental age is only 7; in which case his I.Q. or mental ratio is seven-tenths or 70 per cent. Or it may prove that he has the mental age of 13; in that case his I.Q. is thirteen-tenths or 130 per cent. According to a table given by Burt,¹ children who are capable of the simpler types of post-primary education but no more, have an I.Q., or mental ratio, lying between 85 and 115 per cent.; and when they leave school should be able, according to their position within this range of intelligence, to do semi-skilled or skilled work, or to fill poor or minor commercial positions. Pupils whose I.Q. lies in the range 70-85 fill the dull and backward classes and are fitted only for unskilled labour and coarse manual work; those in the corresponding higher range (I.Q. 115-130) could profit by education in a 'selective central' school and should show themselves capable of clerical, technical and highly skilled work. Still higher in intellectual level are those (I.Q. 130-150) who might be expected to win scholarships to secondary schools and take up with success the lower forms of professional work, and those (I.Q. above 150) who win university scholarships and honours and are capable of the highest types of professional occupation. In sad antithesis to these two classes are the class of mental defectives (I.Q. 50-70) who will be good only for casual labour, and the ineducable residue whose mental ratio is under 50 and will, throughout their life, be 'institutional cases.'

In any concrete human occupation a wide range of factors may come into action. One's I.Q. rarely fails to play a most important part, and in most of the higher types of occupation dominates the stage. But in particular instances more specialized abilities, 'group factors' as they are often called—factors that are quite independent of one's I.Q.—may also be of great moment, and emotional and

¹ 'Mental Differences between Individuals,' *Brit. Ass. Ann. Rep.*, 1923, p. 227. (The figures for scholarship winners refer to standards obtaining in London in 1920.)

temperamental factors of a special character may be essential. There is accordingly a place for tests which shall not concentrate attention upon one aspect of a person's mental outfit, but shall attempt to determine whether he possesses the synthesis of qualities which may be needed for success in a given occupation.

Vocational testing following such lines has developed greatly in recent years, largely owing to the activities in this country of the National Institute of Industrial Psychology. One of the most striking pieces of work performed by the Institute was an early experiment in 'vocational guidance' carried out in the elementary schools of the King's Cross district of London. In the course of the experiment, which began in 1924, 600 school leavers (constituting 'Group A') were chosen in such a way that there remained an exactly similar group ('Group B') of children who were leaving school under parallel conditions of training and opportunities of employment. But between the two groups there was the important difference that while Group B received only the usual kind of advice from the School Conference, the children of Group A received special vocational advice based upon the results of the Institute's tests, supplemented by the reports of teachers, school doctors and home visitors. The Institute's tests consisted of two parts—a general and a special examination. In the general examination tests were applied of 'general intelligence,' school attainments, practical ability and manual skill; the special examination was a selection of tests of ability in clerical work, in understanding mechanisms, in dressmaking and other types of work.

The occupations which the children actually entered could not in all cases be those recommended upon the results of the examination, but the Institute's advice was followed in enough cases to make clear how great would be the gain in personal happiness and industrial efficiency if the entry of young people into economic life could generally be guided by vocational tests.¹

We have seen that the whole practice of mental testing rests upon the implicit theory that from measurements of a person's ability

¹ The full details of the experiment, including the 'follow-up,' are given in a work by E. M. Earle and others: *Methods of Choosing a Career* (Harrap, 1931).

to do certain kinds of things—namely, the things which the tests require him to do—it is possible to infer his ability to do other things apparently quite different from those.¹ This assumption clearly underlay the American Army tests. It is equally clearly involved in the English practice of choosing public officials by competitive examination in ‘general’ or ‘academic’ subjects. Needing young men of sufficient ability to administer the Indian Empire or the home service, we have selected those who, under the conditions of the examination-room, turned out the best set of Greek verses or solved the greatest number of differential equations, and sent them to the East or to Whitehall, confident that those who had shown the highest ability in the one direction would prove to be most able also in the other. The same belief is the keystone of Carlyle’s argument in the *Heroes*.

There is no question that experience has proved the assumption to be broadly true. The queer tests given to the American Army did, on the whole, pick out the best men; our method of recruiting the Civil Service has, on the whole, justified itself. But the assumption cannot be *more* than broadly true; for the inferences about particular persons drawn from the results of mental tests and examinations are only probable, never certain. It is evident, therefore, that a more elaborate theory is needed; one that will account both for the general prognostic value of the tests, and also explain why precise inferences about individuals cannot be drawn from them.

One cause of divergency may at once be set aside. The cleverest youth may fail to fulfil his promise because he is lazy or corrupt, or, though virtuous, is lacking in some moral quality necessary for success in his chosen line of life.² These things happen, but are

¹ This theory must be distinguished from another with which it is often confused—namely, the theory that by dint of doing one kind of thing one can acquire the power of doing something else without separate practice at it. The former theory, we shall see, is true; the latter—the theory of ‘formal training’—is, broadly speaking, false. As G. B. Shaw succinctly said, ‘No man ever learns to do one thing by doing something else’ (*The Perfect Wagnerite*, 1898, p. 129). See pp. 260–3.

² Burt records the case of a young woman who headed the list in a vocational test but proved a failure in the workroom—simply because she was an irrepressible chatterer.

irrelevant to the question before us. That question concerns only intellectual powers, not moral qualities, and asks why mental tests, which pretend to diagnose those powers, do so on the average with remarkable success but with considerable deviations from success in particular instances.

The problem of the nature and constitution of human abilities which here comes into view is the subject of the following chapter ; but before it claims our attention the place of mental testing in the educational cosmos must be considered a little further.

In all advanced countries schools distinguished as primary and secondary are the main constituents of the educational system ; but where democratic ideas prevail the original significance of these names has undergone a radical change. In England, for instance, the primary schools (officially known as 'elementary') were in their first inception designed to give an education suitable 'to the children of the labouring poor,' and, as such, stood in sharp social and cultural contrast with the secondary schools, of which the ancient grammar schools represented the prevalent and most authentic type. Without going into historical details it will suffice to say that this conception of the two school systems, long obsolete in the United States, has gradually lost its vitality in our own country and is now dying, if not already dead. Primary and secondary education are now thought of not as parallel, self-contained and alternative, but as successive phases in a single universal scheme. In brief, the primary phase, ending between eleven and twelve years of age, gives instruction and training designed to meet the intellectual and moral needs of childhood and to supply the indispensable basis for the secondary phase—the education of youth. Here the natural differences between children become more important, and different types of secondary schooling varying in correspondence with them are clearly called for. Nevertheless all secondary schools, whether they are called 'public,' 'grammar,' 'technical,' or 'modern' schools, are concerned with what are, at bottom, only variants of a single problem: the problem of dealing fruitfully with a life-period whose central fact is adolescence. This view does not exclude wide variations in curriculum. It implies only that these should not be social distinctions, but are to be based solely upon differences in the ability, *ingenium* and needs of the

nation's youth. Thus it means, among other things, that the rich man's practically minded son, whose powers are starved under a literary regimen, would, as a matter of course, find salvation in a technical or craft school, and that the noble tradition of the English grammar school would in time assimilate the 'selective central' schools which once occupied a somewhat anomalous place in the elementary system.

This is, in outline, the position created for England and Wales by the great Education Act of 1944. It raises many problems for administrators, but by far the most important, and certainly the most delicate, is the problem of directing children from the primary schools to the secondary schooling¹ best suited to their needs and capacities. Upon this question psychology has something definite to say, and must urge it even though insistence upon it can hardly be popular. There is no doubt that (as in an instance given above) differences in *ingenium* will often point to this school or to that as the one suitable for a particular child; but to suppose (as is too often done) that the only differences that need be considered, or even recognized, are differences in the 'type of mind' is to ignore a fact of over-riding importance—namely, that the 'general intelligence' of boys and girls of the same chronological age covers, during the secondary school years, a range so wide as to make a common standard of instruction neither just nor practicable. At the critical age of eleven the dullest children attending primary schools in our greater cities have been found to have a mental age of eight years, the brightest a mental age of fourteen or more.² No one who realizes the meaning of these statements can think that we are required, in the name of equality of educational opportunity, to impose upon the duller children a curriculum that would constantly baffle their modest abilities and rob them of the pleasure they might and ought to feel in tasks within their powers, or to hold back the brighter ones from the high intellectual enterprises nature has fitted them to undertake. From this argument it follows that while in the allocation to secondary schooling a child's special gifts and the

¹ Here and elsewhere we distinguish between a *school* and the types of *schooling* (for there may be several) that are provided in it.

² C. Burt's article, 'The Education of the Young Adolescent' in *Brit. Journ. of Educ. Psych.* for November, 1943.

trend of his interests should always be studied, his 'I.Q.' is the indication to which most weight should be attached. Hence the great importance of making the technique of mental testing as perfect and as widely understood as possible.

To parents who cannot take a realistic view of their child's limitations, a doctrine that may exclude him from studies through which other people's children find their way to gratifying successes and desirable employment, can hardly be acceptable. Yet that doctrine is the only one that offers to all children alike an intellectual environment likely to bring out and make the most of their natural powers. In the general interest a community must seek out high intelligence wherever it can be found and see that it is provided liberally with all it needs for full development; but, if it is wise, it will also see that the abilities of the less intelligent are fostered with equal care—if only because 'without these cannot a city be inhabited' and it is they who 'will maintain the state of the world.' Here, then, as always, the claims of individuality and of social need are found to be convergent if not indistinguishable.

The psychologists who have done most to develop the scientific use of tests of intelligence and capacity are foremost in insisting that these furnish only a part—though an essential part—of the evidence upon which educational and vocational guidance should be based. But they also agree in urging that the general impressions even of experienced teachers furnish trustworthy evidence only when they are guided systematically by adequate records of all relevant facts. The types of record likely to be of most use and the best ways of collecting, colligating and using them are matters for research to which the adoption of universal secondary education gives a new urgency.¹

NOTES ON BOOKS, ETC.

C. GORING, *The English Convict* (H.M. Stationery Office, 1919), gives the Galtonian view in an uncompromising form. M. W. KEATINGE, *Studies in Education* (Black, 1916), and G. H. THOMSON, *A Modern Philosophy of*

¹ See *The Educational Guidance of the School Child* (Evans Bros., 1927), for a pioneer inquiry by a group of members of the Institute of Education, under the leadership of Prof. H. R. Hamley, working in concert with members of the Wiltshire County Education Service.

Education (Allen & Unwin, 1929), tend to the same side. The opposite is championed in F. H. HAYWARD, *Education and the Heredity Spectre* (Watts, 1908). P. SANDIFORD, *Foundations of Educational Psychology* (Longmans, 1938), contains an admirable, up-to-date review of work bearing on this controversy. For A. BINET's pioneer work see his *Les Idées modernes sur les Enfants* (Flammarion, 1910). C. BURT, *Mental and Scholastic Tests* (P. S. King, 1921), is an encyclopædic work on tests, and the Report of the Cons. Comm. of the Bd. of Ed. on *Tests of Educable Capacity* (H.M. Stationery Office, 1924), a wide review of their uses in education. P. B. BALLARD's books, *Mental Tests* (Hodder & Stoughton, 1920), and *Group Tests* (Hodder & Stoughton, 1922), are 'popular' but scientific. E. R. HAMILTON, *The Art of Interrogation* (Kegan Paul, 1929), is lucid and original. L. M. TERMAN, *The Intelligence of School Children* (Harrap, 1921), is important for American practice. C. BURT, *The Backward Child* (Univ. of London Press, 1942), gives an up-to-date account of the educational uses of psychological tests and discusses several of the problems touched upon in the foregoing chapter. C. S. MYERS, *Industrial Psychology* (Home Univ. Lib.) is a simple treatise by the Director of the National Institute and some colleagues. MAY SMITH, *An Introduction to Industrial Psychology* (Cassell, 1943), is a fuller review of the subject. The report of the INDUSTRIAL HEALTH RESEARCH BOARD on *A Study in Vocational Guidance* (H.M. Stationery Office, 1926), outlines a scheme for examining children of school-leaving age, and describes the first systematic experiment on vocational guidance in this country.

CHAPTER X

Mental Measurement

The publication in 1904 of a striking memoir ¹ by Professor C. Spearman gave a revolutionary turn to the study of human endowment; for it heralded the invasion of Binet's simple universe by mathematical ideas and methods due originally to Galton and Karl Pearson. To attempt to give more than a general account of this movement would be to travel beyond our province; but its main results have so much significance for educational progress and play so large a part in current discussions that they cannot be ignored. We propose, therefore, to examine in a strictly elementary way some of the notions upon which the new theories are based and to review some of their more important applications.

1. *Frequency. Normal Distribution.* Imagine all the pennies collected from the street telephones of a city during a certain period to be arranged in piles, each containing only the pennies of a particular date; and let the piles be placed in a row at equal intervals apart and in order of date. As thus arranged, their heights will present to the eye a picture of the frequency with which the pennies of each date occur in the whole. One could count the coins and so obtain data for a *frequency-diagram* in which their *distribution*, in accordance with their age, could be represented by a series of vertical lines of proportionate heights, standing at equal intervals along a horizontal line or *base*. Such a diagram would be a more convenient substitute for the actual piles of pennies. It would be useful to draw (as in temperature charts) a line passing through the tops of the verticals. This line would probably rise and fall somewhat capriciously, but one can imagine the height of the verticals to vary with such smooth regularity as to suggest that their tops lay upon a definite curve. This, if it existed, would be the *frequency-curve* of the distribution.

Many phenomena in nature and society have distributions marked

¹ 'General Intelligence objectively Determined and Measured' (*Amer. Journ. of Psych.*, 1904, xv, 201).

by characteristic frequency-curves. For instance, the curve recording the number of persons treated for scarlet fever during the once frequent epidemics always showed a rapid ascent from birth to age 5, and thereafter a gradual fall to the end of middle age. Oddly enough, Lord Rutherford, counting the number of *alpha*-particles expelled from a radio-active metal during a long series of equal intervals, obtained a frequency-curve of exactly the same shape; the number of intervals during which 0, 1, 2, 3, . . . particles were expelled rose rapidly to a maximum and then fell off gradually, like the cases of scarlet fever! Taxable incomes have a different distribution. The lowest incomes taxed are much the most numerous, and the frequency falls rapidly until the multi-millionaire is reached. Hence the frequency-curve has the shape of a J reversed. House property-values show the same frequency-curve, and so did the petals the botanist De Vries counted on the blooms of his *Ranunculus*; for their number fell in the J-manner from 123 blooms with 5 petals to 2 blooms with 10 petals.¹

Let 6 pennies be shaken up in a hat and cast out upon a table, time after time. Then the number of heads obtained in a throw will, as chance decrees, vary from zero to six; but, as throw succeeds throw,² the *proportions* of the throws that yield no heads, one head, two heads, and so on up to six heads will gradually approach the series:

1, 6, 15, 20, 15, 6, 1

(The reader may recognize that these figures are the successive coefficients in the expansion of $(1 + x)^6$ by the binomial theorem.) These frequencies, when graphed, produce a bow-shaped curve, symmetrical about the middle vertical (or 'ordinate'). Theory shows that if not only the number of throws but also the number of pennies is endlessly increased, the graph approximates to a definite curve—known as the *normal curve* or *curve of errors*. This curve emerges whenever the elements determining the frequencies are immensely numerous and each is equally likely (as the heads

¹ These distributions are figured in Nunn, *Teaching of Algebra* (1914), pp. 572-5.

² The author's (school) class once co-operated to supply him with several thousand counts—a highly popular piece of homework!

and tails are) to be present in or absent from any one of the things measured or counted. That is, perhaps, why bodily dimensions, such as the statures of any large group of persons of the same nationality and sex, follow the normal law of distribution. Actual school surveys have shown that educational abilities, the I.Q. and, indeed, most mental characters in homogeneous groups of children and adults also approximately conform with it. It follows that the mathematical properties of the normal curve play a great part in the scientific study of many psychological and educational problems (cf. Burt, *Educational Abilities*, pp. 32 f., figs 6 and 7).

2. *Standard Deviation. Standard Scores.* In the following table the second line gives the (purely imaginary) marks per cent. obtained by 10 candidates in an examination in algebra, the candidates A, B, C, etc., being named in order of merit from the poorest to the best:

	A	B	C	D	E	F	G	H	I	J	
Marks :	38	46	46	50	53	55	58	64	78	92	[Average, 58%]
x :	-20	-12	-12	-8	-5	-3	0	+6	+20	+34	$[\sigma = 15.42]$
z :	-1.3	-0.8	-0.8	-0.5	-0.3	-0.2	0	+0.4	+1.3	+2.2	$[\Sigma z^2 = 10]$

In discussing the achievements of the candidates one would naturally begin by observing that G secured the average mark (58 per cent.), that the marks of H, I and J were above the average and those of the rest below it. It would also be natural to inquire next how much the marks of the several candidates differed from the average. That question is answered in the third row of the table. These figures, each with its *plus* or *minus* sign, are called the *deviations* of the marks, and are usually symbolized by the letter x .

Now although the deviations indicate clearly how a competitor stands among his fellows, they have one obvious defect—namely, that their size depends upon the scale of marks adopted by the examiner. If he had used a more ‘open’ scale the deviations (both the positive and the negative) would have been larger; if he had

been more sparing of marks they would have been smaller. It would be useful to remove this source of variability, and the last row of figures shows how it may be done. Let two examiners mark the papers, and let it be supposed that they agree about the relative merits of the candidates but express those merits by means of differing scales of marks. This difference would best be brought out by calculating the average of their deviations. Let that average be 16 for one examiner and 13 for his less generous colleague; then it is clear that 16 of the former's marks are equivalent to 13 of the latter's. Hence, if their deviations were divided respectively by 16 and 13, identical lists of scores would result.

But an important technical point arises here. Since the positive and negative deviations balance one another, their sum would always be zero, unless one ignored their signs—an idea abhorrent to the mathematical mind. To avoid so painful a necessity the statistician adds, not the actual deviations, but their squares. This simple device turns them all into positive numbers and also (as seems desirable) gives greater weight to the greater deviations, whether positive or negative. In our table the sum of the squared deviations is 2378, and there are 10 of them (including zero). Hence their average (which is called the *variance*) is 237.8. If we now take the square root of the variance (it is 15.42), we shall return, so to speak, to the level from which we started. The figure, 15.42, with which we arrive there is the special form of average deviation the statistician prefers; it is called the *standard deviation* of the original marks, and is denoted by the symbol S.D. or the Greek σ . The last thing to do is to divide each of the deviations x by the S.D., and so obtain the figures set out (to a single place of decimals) in the final line of the table. These are called *standard scores*, and are usually symbolized by the letter z .

Like the original deviations, the positive and negative standard scores balance about zero, so that their sum is itself necessarily zero. What is much more interesting is that the sum of their *squares* is always equal to the number of persons examined. Luckily the proof of this important property is extremely simple. Since the standard scores are the original deviations divided by their standard deviation (S.D.), the *squared* scores are, of course, the *squared* deviations each divided by the *square* of the S.D.—that is,

divided by the variance.¹ If the phrase 'sum of the squared deviations' be shortened into 'sum of sqd. devs.' it obviously follows that :

Sum of the squared scores = Sum of sqd. devs. \div Variance.
But the variance is itself the sum of the squared deviations divided by the number of persons. Hence our statement may also take the form :

$$\text{Sum of the squared scores} = \text{Sum of sqd. devs.} \div \frac{\text{Sum of sqd. devs.}}{\text{No. of persons}}$$

and this, in accordance with the familiar rule for division by a vulgar fraction, can be turned into :

$$\text{Sum of the squared scores} = \text{Sum of sqd. devs.} \times \frac{\text{No. of persons}}{\text{Sum of sqd. devs.}}$$

It is now evident that the sum of the squared deviations could be cancelled out, leaving us with the conclusion that the sum of the squared scores must be equal to the number of persons. Students who like to use symbols for such statements may prefer to write it in the concise form $\Sigma x^2 = N$, where the Greek letter Σ indicates summation and N means 'the number of persons.'

Since the sum of the squared scores is N , their variance must (by definition) be N divided by N —that is unity. And, since the standard deviation is the square root of the variance, the S.D. of every series of standard scores must also be unity.

Whenever any variable character has a normal distribution, knowledge of its S.D. may lead to important inferences. Suppose, for example, that we have before us a normal curve representing graphically the I.Q.s of a large number of children. Then it is obvious that 50 per cent. of the deviations from the average are positive and 50 per cent. negative; but a mathematician familiar with the properties of the curve could tell us much more than that. From the tables printed in almost every statistical textbook he could, for instance, assure us (i) that 34.13 per cent. of the deviations deviate *above* the average by less than *once* the S.D. ($+1\sigma$) and that 15.87 per cent. (*i.e.*, $50 - 34.13$) deviate by more; (ii) that 47.7 per cent. are less than $+2\sigma$ and 2.3 per cent. (*i.e.*, $50 - 47.7$)

¹ For, by definition, the S.D. is the square root of the variance.

greater; (iii) that 49.86 per cent. are less than $+3\sigma$ and 0.14 per cent. greater, with identical percentages for deviations *below* the average. The last pair of figures shows that children whose I.Q. exceeds the average by more than three times the standard deviation must have exceptional ability; for there are only 14 of them in every 10,000 children.¹

We may pause here to consider the bearing of these ideas upon a problem of much difficulty and importance—namely, the just selection of children for entry to courses of higher education.

Our first inquiry will follow the guidance of Professor Burt.² As a result of widespread investigations Burt felt able to assign an average I.Q. to the children of each of the eight social classes into which parents may be divided: namely, the highest professional and administrative class (120.3); the lower professional, technical and executive class (114.6); highly skilled and clerical (109.7); skilled (104.5); semi-skilled (98.2); unskilled (92); casual (89.1); institutional (67.2). He also ascertained (i) that the average I.Q. for fee-paying children attending London secondary (*i.e.*, grammar) schools was 114, and for scholarship-holders 133, and (ii) that the standard deviation of the children's I.Q. in the several social classes varied between 12 in the highest and 16 in the middle categories.

Now the difference between 114 and 92 is 22; so that an 'unskilled' child whose I.Q. exceeds the average for his class by more than 22 units stands higher in the scale of intelligence than the average fee-paying pupil. But, if we take the S.D. in the 'unskilled' class to be 16, a deviation of 22 ($= 16 \times 1.38$) is 1.38 times the S.D.; and the theory of the normal curve shows, accordingly, that children with a deviation greater than this would include 8.4 per cent. of the whole class. Again, we have $133 - 92 = 41$ or 16×2.56 , and, by the theory of the normal curve, a deviation greater than 2.56σ is likely to occur in 0.53 per cent. of the cases. We must infer, then, that 5 or 6 children out of every 1,000 in the 'unskilled' class possess mental ability of at least scholarship standard. The large numbers in the unskilled class would raise this modest proportion to a far from negligible figure.

¹ The mode of calculating such figures is explained in Note A on p. 150.

² See his article 'Ability and Income' in the *Brit. Journ. of Educ. Psych.* for June, 1943.

It is no less pertinent to observe that since $133 - 120.3 = 12.7$ (which we may take to be roughly equal to the S.D. for the highest class), only about 16 per cent. of the children in that class are likely to have had sufficient ability to guarantee the winning of a scholarship; and also that since $120.3 - 104.5 = 15.8$, i.e., 12×1.32 , more than 9 per cent. probably have less mental ability than the average child in the 'skilled' class.

In England and Wales the 'scholarship examination' is no longer to be held; but if the type of post-primary education a child receives is to be determined not upon social grounds but always with due regard to his ability and consequent mental needs and possibilities, much weight must continue to be attached to inferences such as those set forth above.

For a second example we turn to Scotland, where a determined effort is being made to place the selection of children for higher education upon a firm scientific basis. A method recommended by the Scottish branch of the International Examinations Inquiry is to make use of 'profiles,' akin to those previously used by Burt, to present graphically the outstanding mental characters of individual children (*Educational Abilities*, pp. 64 *et seq.*). Across a sheet of squared paper a firm line is drawn 3 inches or more above the bottom edge. This is the base or zero-line from which vertical measurements are to be made to record a child's standard scores in a number of standardized tests. Since all the distributions may be assumed to be normal, standard scores greater than $+3\sigma$ or less than -3σ will rarely occur (p. 134); it is, therefore, sufficient to graduate the left-hand edge of the paper from 0 to $+3$ above the base-line and from 0 to -3 below it.

Seven items are entered on the sheet: namely (i) the child's I.Q., (ii) the marks he obtains in two tests in English and two in arithmetic, (iii) the teachers' estimates of his standing in these two subjects—all reduced to standard scores. Minute circles or dots at the proper heights above or below the base-line record these seven scores, and an eighth dot is added to record their (standardized) average. A broken line passing through the eight dots constitutes the profile. Three more dots, detached from it, record estimates of the child's ability in practical subjects, his health and his industry. A final dot records the forecast (also in standard terms) of his

probable fitness for higher education, based upon consideration of the ten estimates.¹

In McClelland's collection of profiles there is one in which every score exceeds $+2\sigma$ and the child's I.Q. reaches the very unusual level of $+3\sigma$ (cf. p. 134). This profile presents a happy picture of brilliant promise. Tragedy is represented by another in which all the scores lie between -2σ and -3σ . Children like these two give no trouble to the adjudicators. A third child whose scores are all spread between $+\sigma$ and $+2\sigma$ is marked as a 'clear admit'; for the pass-mark for admission to the higher course may be taken as $+0.7\sigma$; but a fourth, who has three scores below the 0.7σ level—though still above the baseline—is 'a border admit.' Lastly, a child whose score in an arithmetic test is about -0.6σ and whose other dots all lie between the zero-line and the 0.7σ limit must be accounted 'a clear reject.'

3. *Correlation.* For the last of our fundamental notions we return to the class of 10 pupils and suppose them to have taken a second examination in geometry, in which (the candidates being named in the same order as before) their marks were: 36, 30, 43, 50, 58, 48, 46, 45, 53, 71. Here the average mark is 48 per cent. Using it, the reader may calculate the deviations, find their variance to be 116.4 and, taking the square root, deduce that the S.D. is 10.79. Lastly he may divide each deviation by the S.D. and thus obtain the standard scores in geometry given (to one decimal place) in the third row of the following table:

STANDARD SCORES

Cand.	A	B	C	D	E	F	G	H	I	J	
Alg.	-1.3	-0.8	-0.8	-0.5	-0.3	-0.2	0	+0.4	+1.3	+2.2	$[\sigma=15.42]$
Geom.	-1.1	-1.7	-0.5	+0.2	+0.9	0	-0.2	-0.3	+0.5	+2.1	$[\sigma=10.79]$

¹ W. McClelland, *Selection for Secondary Education* (Univ. of London Press, 1942). In this important work a number of characteristic profiles are figured and discussed, and careful consideration is given to difficulties and technical details here ignored.

There are obvious differences between the performances of the candidates in the two subjects but also a certain amount of agreement. When one asks, 'What is the correlation between them?' one is asking for a figure that can be taken as an assessment of that agreement. Now if the candidates' achievements in the two subjects had been exactly the same, the two rows of scores would have been identical; and if each score in the upper row were multiplied by the corresponding score in the lower row, the series of products would be simply the squares of the scores in that row. But we know that the sum of those squares must be equal to the number of persons examined—here 10. We can say, then, that if the agreement between the two lists is perfect the sum obtained by adding together the products of the scores will always be equal to the number of examinees. In actual cases such as the one shown in our table the sum of the products is bound to be less than 10.¹ Suppose it to be 7.5. Then since 7.5 is three-quarters of 10 we can say that the agreement is three-quarters of the way towards perfection, or that the correlation is 0.75. The reader will find that the product-sum is actually 7.97. We may infer, therefore, that the correlation between the marks in algebra and geometry obtained by these candidates in this examination is $7.97 \div 10$ or practically 0.8. If the product-sum had been -7.97 the two lists would have been more than three-quarters of the way towards perfect *disagreement*—the disagreement being perfect when every candidate's mark in one subject is as much below the average as his mark in the other subject is above it. In that extreme case the product-sum would be -10 and the correlation -1 ; if the product-sum were -7.97 the correlation would be -0.8 . If the product-sum were zero the correlation would also be zero, and we should infer that the scores in the two subjects were entirely independent. To sum up: the correlation between two lists of standard scores is the product-sum of corresponding scores divided by the number of persons tested.²

It is obvious that no conclusions of scientific value could be

¹ For a proof of this statement, see Note B (p. 151).

² The above method of measuring correlation is called the 'product-moment method.' It was introduced into modern statistics by Karl Pearson, who thus revolutionized the approach to psychological as well as other biometric problems.

drawn from so small an experiment as the one just considered—even if it were a real one and not hypothetical. To obtain inferences valid beyond the particular experiment the psychologist must work with a group of candidates large enough and so chosen as to be a ‘fair sample’ of the possible candidates as a whole, and he ought (this is a counsel of perfection) to make them take several examinations in algebra and geometry. Even then the correlation (r), accompanied by an assessment of the possibilities of error too technical to be explained here, would be only an estimate of a probability—not the measurement of a certainty. Speaking broadly, the nearer r approaches unity the greater is the likelihood that any candidate whose success in algebra is good, middling or poor will also have good, middling or poor success in geometry. More precisely, r is a numerical estimate of that likelihood in accordance with a rule known as Galton’s law of regression. From a large number of candidates let those be picked out who have earned a particular score in algebra—it may, for brevity, be referred to as ‘alg.’ These candidates will not all earn also the same score in geometry, but will have scores clustering round an average value which, though not the unique is yet the most probable score. If we describe that most probable score as ‘geom.’ then the law of regression asserts¹ that

$$\text{geom.} = \text{alg.} \times \text{correlation.}$$

Since r is, in practice, always less than unity, a predicted most probable score must always be less than the score from which the prediction started. Galton’s most striking illustration of this rule is the fact that the sons of tall fathers, say 6 ft. high, form a group whose average stature, though high, is always less than 6 ft., and that sons of dwarfs of a given height are a low-statured group, but have an average height greater than their fathers’. In all cases there is a movement or regression towards the general average.

We shall see later that analysis of the correlations between a number of independent tests may lead to wider inferences of great importance; but the practical value of a correlation-coefficient as an estimate of probability must always be a matter of prime interest.

To illustrate this principle we may refer to the attempts of the

¹ A simple proof of the law is given in Note C, p. 151.

Scottish researchers already mentioned on p. 135, to determine what test or combination of tests supplied the surest forecast of a child's probable success in his secondary education. For that purpose the correlation was calculated between the achievements of a large number of secondary school pupils, expressed as standard scores, and the previous performances of the same children in a number of single tests and 'batteries' (*i.e.*, combinations) of tests. There were fifteen batteries and the correlations varied from about 0.805 to about 0.690, the highest coefficient being yielded by a battery which supplied, in a single standardized score a combination of a child's I.Q., his performances in the Scottish Qualifying examination in English and arithmetic and the teachers' estimates of his merits.¹

Vocational selection and guidance offer another field in which it is sometimes possible to obtain standardized estimates of the proved fitness of a number of young employees and to compute the correlation between those estimates and their scores in tests previously applied. In this case the aim is to find what battery of tests will indicate with the fewest errors the probabilities of a young person's success or failure in a particular vocation. The tests applied to army recruits and applicants for employment in the Civil Service (p. 121) are examples of vocational tests whose predictive value was carefully verified in this way.

We are now in a position to consider some of the wider inferences to which the study of correlations has led. In this field of research Professor C. Spearman was at first the dominant figure, though it has attracted in Britain and the United States an army of other workers, some of outstanding distinction,² who have entered it to defend, to criticize or to extend Spearman's challenging doctrines.

Let it be supposed that the standard scores in algebra and

¹ McClelland, *op. cit.*, Chs. VI and VII. These chapters include a valuable discussion of the theoretical difficulties that arise.

² *E.g.*, in the United States, L. L. Thurstone and T. L. Kelley; in Britain, Cyril Burt, G. H. Thomson and W. Brown. J. C. Maxwell Garnett's mathematical interventions in support of Spearman's doctrines have been of much importance.

geometry given on p. 136 were extracted from examination-lists covering the entire secondary school population of the relevant standing, and that the complete results indicate a 'true correlation' of 0.72 between algebra and geometry. We have already seen that this figure has a certain prognostic value, and we are now to ask what light it throws upon algebra and geometry regarded as modes of intellectual activity. The first conclusion it suggests is that the mental processes concerned in the two subjects must have a good deal in common or the correlation between them would not be so high as 0.72. For, as we have seen, this implies that (when the scales of measurement are the same) an examinee's most probable score in one of the subjects will be 0.72 of his actual score in the other subject.¹ Yet the processes brought into play in learning them cannot be completely the same; for in that case (apart from accidental errors in marking) every examinee's score in algebra would be the same as his score in geometry, and the correlation would be + 1. We are so far led, following Spearman and using his terminology, to conclude that the two processes must include a 'common factor' which accounts for their positive correlation and also two different 'specific factors,' one in algebra, one in geometry, which account for its being less than + 1.

It is natural to think of the common factor as a mental power or ability which comes into play whether one is attacking problems in algebra or problems in geometry. An examinee endowed with this power in a high degree will tend to score well in both subjects, but will not necessarily obtain the same scores as another one who is equally endowed with the common factor; for the two may be differently equipped in respect of the specific factors that aid success in algebra and geometry respectively. One may, for instance, possess an active spatial imagination that aids him in dealing with 'riders,' but is lacking or less pronounced in the other. Every actual mental activity must, of course, include and be affected by special elements like this; but we can give rein to our fancy and conceive a subject in which achievement would depend solely upon the factor common to algebra and geometry. If our examinees took this ideal subject they would not all gain the same scores, for

¹ The reader is reminded that 'score'—here and elsewhere—means 'standard score,' and that it may be either positive or negative.

some would be richer than others in the mental power assumed ; but all those in whom that power was equal would score alike.

Let us suppose that the examinees' scores in the ideal subject have a correlation of 0.9 with their actual scores in algebra and of 0.8 with their scores in geometry ; then it is easy to see that a correlation of 0.72 (*i.e.*, 0.9×0.8) is to be expected between algebra and geometry. For if we consider a group with a particular score in algebra—as before, let it be called 'alg.'—then, by the law of regression, their most probable score in the ideal subject would be $\text{alg.} \times 0.9$. Moving on from the ideal subject to geometry, we shall expect those whose score in the former is $\text{alg.} \times 0.9$, to have, on the average, a score of

$$\text{alg.} \times 0.9 \times 0.8 \text{ or } \text{alg.} \times 0.72.$$

But, by the law of regression, that is exactly what should happen if the correlation between algebra and geometry is 0.72. In short, we have shown that the correlation between those two subjects is necessarily equal to the *product* of their correlations with the ideal subject.

Now Spearman's theory (in its simplest form) was that what has just been said about the activities involved in learning algebra and geometry may be extended to *all* cognitive activities—whether they bring into play the highest powers of intellect or the humbler powers demanded by tests of spelling or the ability to estimate the lengths of lines. He found that, if tests of clearly different kinds were applied, with due technical precautions, to a group of persons, there was a positive correlation between the results of each test and those of every other test. It was, accordingly, a highly plausible inference that what we contemplated as an element common to algebra and geometry is actually a factor that enters into all cognitive activities and accounts for the correlations between them.¹ A layman might identify this all-pervasive factor with what he thinks of as 'general intelligence' or, borrowing greater refinement from

¹ Spearman (*Abilities of Man*, App. I) seeks to justify this inference mathematically. Although the hypothesis of a general factor has not gone unchallenged either in this country or in America, nevertheless the majority of British psychologists appear now to accept it, and even those who doubt the existence of 'intelligence' as a general factor do not hesitate to use 'intelligence tests'

a phrase of Cyril Burt,¹ as 'innate general cognitive efficiency,' but Spearman, impressed by the wide variety of its manifestations, preferred to denote it by the non-committal symbol g , and as g it is known everywhere in psychological circles. In Spearman's theory, then, every cognitive test or mode of cognitive activity has a positive correlation with g : that is with the scores the same persons would earn if they could take also an ideal test in which achievement depended solely upon the common factor. That correlation is often described as the 'amount of g ' in the activity in question, or the degree in which it is 'saturated' or 'loaded' with g . By a generalization of what we observed in the hypothetical case of algebra and geometry (p. 137), the correlation between any two subjects (so far as it is due to this common factor) must be the product of their saturations with g .

The hypothetical score of a particular person, say John Smith, in the ideal test is Smith's personal g . Assuming that the correlation with g is known for a number of tests (a matter to be taken up later), a probable estimate of the personal g is easily obtained. For, to recur to our previous example, if Smith's score in algebra is 'alg.' the law of regression declares that his most probable ideal score will be $\text{alg.} \times 0.9$, because 0.9 is the correlation of algebra with g . Similarly, if his score in geometry is 'geom.' his personal g will be estimated as $\text{geom.} \times 0.8$. Other estimates can be obtained in the same way from other tests. They will not be in perfect agreement, for perfectly harmonious test-scores are never to be obtained; but, if we are content to ignore the possible influence of the less important group factors, the *average* of the several estimates may be used as a first approximation to a measurement of John Smith's 'general intelligence,' at any rate for practical purposes.²

¹ Cf. *Brit. Journ. of Psych.*, III, 1909 (pp. 94-177), and other papers, where the foregoing 'product theorem' was used to demonstrate the presence of a 'general factor' which appeared to a large extent hereditary. For a recent summary of the evidence that the general cognitive ability is innate, the student may refer to *Brit. Journ. Educ. Psych.*, XIII, 1943 (pp. 88-92).

² *Abilities*, App. IV, gives a more rigorous formula for weighting the several tests on the assumption that their inter-correlations are due exclusively to a single common factor. If (as most psychologists now hold) other factors besides g enter into the tests, then the weights will be calculated in

The reader will now understand that, in Spearman's 'Two Factor theory,' the (standard) score of a particular person in a particular test depends partly upon the constitution of the test and partly upon the constitution of the person. For every test has a certain 'saturation with g ' and in addition involves a specific factor s of its own; and the relative amounts of these factors have to be taken into account in conjunction (i) with the subject's personal g , which determines his success in processes involving the first factor, and (ii) with his personal equipment in respect of the specific factor.¹ The proportions between the factors vary widely from test to test. Spearman found reason to believe that the ratio of g to s in classical studies was as much as 11 to 1, but in musical talent only 1 to 4—the specific factor being here definitely predominant. It follows that from a student's talent for classical studies predictions of his ability in other directions can be made with relative security,² but that musical talent is a poor prognostic of any other kind.

The postponed question how the correlation or 'saturation' of a set of tests with g can be ascertained must now be faced. A psychologist would usually determine the saturations by calculations

accordance with the ordinary 'multiple regression equation' (the theory of which is due originally to Udny Yule); Spearman's procedure, indeed, may be regarded as a special application of this wider principle. (For a simple exposition of this wider principle, see Burt's Appendix to *Marks of Examiners*, pp. 297–304, Methuen, 1936).

¹ For instance, if success depends to a considerable extent upon quick and accurate vision (the specific factor) a person with defective sight will tend to do badly. But he may make up his defect in respect of the specific factor by bringing an unusually high personal g to bear upon the test.

² Hence the important position assigned to classics in the higher Civil Service examinations was justified—though it is not certain that a direct 'intelligence test' might not be an even better index of the candidates' ability. The reader should again note that what Spearman has reported does not imply that the study of the classics *creates* talent more than the study of any other subject; it means merely that performance in classics is a singularly good index of the talent a man is born with. Cf. footnote on p. 124.

Spearman has suggested (*Abilities*, p. 221) that in every one, owing to the operation of chance, specific factors must in some directions be so great as to make even the dullard a genius in one particular line; but this perhaps is meant only as a playful hyperbole.

based upon a table of all the correlations between the tests, taken two by two. Unfortunately even the simplest of these methods is complicated to describe, and could be justified only by an algebraic argument too formidable for these pages.¹ But Cyril Burt, in solving an analogous problem ('correlation between persons'), has discovered and employed a method which avoids the forbidden field and uses only notions with which the reader is now familiar. Risking unorthodoxy, we venture, therefore, to adapt Burt's brilliantly simple method to our problem.

Let us, then, suppose that a group of persons, A, B, C, D, etc., have taken a series of tests, numbered 1, 2, 3, 4, etc., chosen to represent fairly and adequately the variety of intellectual activities of all sorts that are known to correlate positively with one another. The results are to be collected in a table in which the scores obtained by A, B, C, . . . are entered in columns under the numbers 1, 2, 3, etc., which label the tests. The entries in each column are then to be converted into series of standard scores by the method described on p. 132. When all the standard scores have been entered in a second table, similar in arrangement to the former one, the scores in the row prefaced by A's name are to be added and their total entered in a new column at the right-hand end of the row. The other rows are to be treated in the same way. Lastly, the column of totals is also to be converted into a series of standard scores.

Now if it were not for the intrusion of the specific factors, the correlation of each of the tests with the 'ideal test' would be perfect, and the scores, say of A or any other of the persons tested, would be the same all along the row—for they would be simply his personal *g*. But if the tests are sufficiently numerous and representative, the specific factors in any one row will be simply a random series of possibilities, equally likely to be great or small, positive or negative, and will therefore tend to cancel out in the total. Thus the totals, when standardized, will be a series as near to the ideal series as we can get. Hence, to find the saturation of a particular test, say test 5, with *g*, we have only to find the correla-

¹The reader will find a lucid description of this method in G. H. Thomson, *The Factorial Analysis of Human Ability*, Ch. II, and a very clear exemplification of it by its inventor, Cyril Burt, in his *Factors of the Mind*, App. I.

tion between column 5 and the column of standardized totals. The correlations or saturations thus calculated present a general view of the common factor as it actually runs through the whole set of tests. If the set is of the type Spearman considered normal, if, that is, each specific factor appears in one test and one test only, the analysis is now completed.¹ But if there is reason to think that the situation is complicated by the presence of one or more 'group factors,' it must be continued.²

Burt's method would be to subtract from the scores in each row the standardized total (which is also, of course, the standardized average) of the row, and so obtain a table of 'residuals' arranged, as before, in columns under the numerical labels of the tests. Once more the columns must be converted into series of standard scores, the scores in each row must be totalled and a column of

¹ Spearman apparently admitted the theoretical possibility that, besides *g* and the specific factors, there might be group factors (e.g., a factor of verbal facility) affecting some but not all of the correlations; but his opinion was that convincing evidence of their existence was lacking. On the other hand, Burt's experience with normal as well as defective school children compelled him from the first to admit the existence of 'group factors,' i.e., more specialized abilities, which enter into a limited *group* of mental processes only (not into all, like *g*) and which are yet not so specific as to enter into one test only (like Spearman's 'specific' factors, which the Americans prefer to call 'unique' factors); and these specialized abilities became more clearly visible as the development of group testing made it possible to deal accurately with large numbers of testees. This theory of 'multiple factors' assumes that a given set of correlations will normally be the resultant of *several* factors of differing range and importance—much as a physicist assumes that the vibrations causing a particular musical sound are the resultant of a number of component vibrations whose nature may be brought out by analysis.

² Spearman, working upon the correlations between the tests, uses what he calls their 'tetrad-differences' as the criterion of normality. Burt's procedure makes use of the fact that in a normal case the correlation between two tests is the product of the saturations (p. 142). When the saturations have been computed, their products, two by two, should, therefore, reproduce the original table of correlations within the limits of negligible error. If they do not, a second factor is presumed to exist. The 'residuals' obtained when the products of the saturations are subtracted from the observed correlations are made the basis of a new correlation-table. From this table the saturations of the tests for the new factor are computed; and so on *da capo*. (*Educational Abilities*, pp. 56 f.)

standardized totals or averages obtained. Then the correlation of each column with the column of standardized totals is the saturation of that test with the second factor. In practice this 'saturation' can be calculated direct from the residual correlations instead of from the residual scores. For some tests the residuals may be so small that 'sampling errors' might account for them; for other tests they may be of significant magnitude. Scrutiny of these latter tests may reveal the probable character of the factor—whether, for instance, some scores are affected by a 'verbal factor,' others by an 'arithmetical factor', others by a 'manual factor', and so forth.

The presence of *g* in the activities hitherto considered implies that they belong to the intellectual side of mind. But there is another side, at least as important: namely, the one expressed in our emotions and other temperamental characters. An object of constant interest to psychologists from the Greek days as well as to moralists, dramatists, poets and novelists, it also has, in recent years, been brought within the sphere of statistical analysis.¹ Possibly the most instructive excursion into this field is what Burt, its pioneer, calls 'the correlation of persons.' On p. 138 we saw that in order to measure the degree of congruity between two tests (*e.g.*, in algebra and geometry) we must apply them to a large and properly selected group of persons and then calculate the correlation between the resulting scores. By analogy, says Burt, we can measure the degree of temperamental congruity between two persons by getting competent observers to furnish standardized assessments of the strength or weakness in them of certain cardinal temperamental traits, and then proceed to calculate the correlation between the two series of judgments. And just as, in the former case, the tests may be multiplied in number in order to find what factors are

¹ In 1915 Burt announced his discovery of a 'general emotionality,' independent of the general intellectual factor but analogous to it; and E. Webb, working under Spearman's direction, and inquiring what factors in a man, other than the qualities, good or bad, of his actions, determine the judgments others pass upon his character, concluded that those judgments rest upon a basis that includes a central factor (*zw*) which may be described shortly as 'persistence of motives.' In 1919 Maxwell Garnett, working over Webb's data, isolated another general factor which he called 'cleverness' (*c*).

common to all or to sections of them, so in the second case the number of *persons* to be correlated may be multiplied in order to discover how far they resemble one another and how far they may fall into recognizably different temperamental types.

In a typical investigation Burt's subjects¹ were a carefully selected group of twelve women graduates who were graded in respect of eleven traits.² The marks assigned to them were set out as in the first table described on p. 131, with the essential difference that the names of the persons, A, B, C, etc., now stood at the head of the columns, so that each row contained the assessments of the twelve students in respect of a particular trait (No. 1, 2, 3, 4, etc.). As in our hypothetical case, the entries in each column were converted into a series of standard scores, the scores in each row were totalled, and the totals were converted into an additional column of standard scores. By reasoning analogous to that employed before, it may be inferred that this final column gave as true a picture as could be gained, not of the reactions of a number of persons to an 'ideal test' but of ways in which the traits represented by the several rows enter into the constitution of an 'ideal person.' The saturations found by correlating each of the other columns with the final column was, therefore, a measure of the degree to which the actual persons A, B, C, etc., resembled the ideal person whose lineaments had been collected or extracted from the recorded judgments of the observers. The person whose saturation turned out to be the highest might fairly be described as the typical member of the group and used as a standard of comparison with others whose temperament the psychologist might afterwards have occasion to study.

The correlation between Burt's twelve subjects and the 'ideal person' varied from $+0.86$ to -0.81 . The emergence of *minus* signs denotes a fundamental difference between the temperamental common factor and *g*; for it shows that, while *g* is essentially positive, the common element here is 'bi-polar.' This fact was

¹ Described fully in *The Factors of the Mind*, Ch. XVII. In Chs. XVI and XVIII Burt discusses criticisms of his methods and enters into technical questions concerning them.

² Sociability, assertiveness, anger, curiosity, sex, joy, tenderness, sorrow, disgust, fear, submissiveness.

explained when Burt, on comparing saturations with the observed traits of his subjects, observed that those with positive saturations were persons who received positive or at least relatively high assessments for the traits sociability, sex, assertiveness, joy, and anger, and relatively low assessments for fear, sorrow, tenderness, disgust and submissiveness; while those who correlated negatively with the 'ideal person' were subjects whose assessments for the first group of traits were negative and for the second group were positive. Thus it appeared that the ideal person presented by the entries in the final column of the table was what Jung calls an extravert, and that if all the signs of those entries were reversed he would become the ideal introvert.¹ We may, then, conclude with Burt that the table of standardized assessments offers an analysis of a person's temperament under two main heads: (i) his 'general emotionality' which is simply the average of all his assessments for sociability, assertiveness and so forth, and (ii) the degree in which he conforms with the ideal extraverted or introverted type.

Since the standardized totals (or averages) in the final column of the table measure the relative importance of the several traits in the constitution of the 'ideal person,' they (or numbers proportional to them) may be used to construct graphs in which the features (sociability, assertiveness, etc.) in the ideal extraverted and introverted types are represented by points marked at the due distances above or below a base line along which the names of the traits are entered at equal intervals and in order of importance. The graph for the ideal extravert will run from the top left-hand corner to the bottom right-hand corner of the diagram; the graph for the introvert will be exactly like it, but upside down. Diagrams of this kind are printed upon the record-cards Burt uses in his analysis of

¹ C. Jung, *Psychological Types* (trans.) (Kegan Paul, 1923). The distinction between the introvert and the extravert is based upon the way in which a person reacts to events and situations in the outside world. In the extraverted type, whatever impinges upon the mind from outside is, so to speak, at once reflected outwards; the subject adjusts himself naturally and directly to things as they are. In the introverted type, on the contrary, impressions that penetrate at all (there is the man who travels over Europe and is engaged all the time, as W. James said, with his own thoughts) produce their effect rather in reverberations within the mind than in outwardly directed action. Other types and factors no doubt exist.

the temperament of school children, and form a useful background to 'profiles' which record the assessments of individual children in respect of the temperamental traits. Those profiles are drawn in the way described on p. 135, the one difference being that the standard scores recorded are now the assessment of the traits whose names are printed along the base-line. A 'psychogram' thus constructed shows at a glance not only the broad features of a child's temperamental constitution but also its relation to the ideal extraverted and introverted temperaments—a matter which Burt's experience has shown to be of prime importance.¹

Psychologists have put forth widely differing views about the nature of the 'factors' that now engage so much of their attention. Spearman, for instance, formulated the theory that *g* is mental energy, and that the specific factors are 'neural engines' required by the energy in carrying out its operations.² Other psychologists, particularly some American workers, not only deprecate such attempts to account for the existence of factors, but are even inclined to doubt whether they have *any* existence outside the statistical equations in which they appear. Our own interpretation need not deviate from the line taken throughout this book. We began by refusing to regard a mind as a substance inhabiting a body, but maintained that the word 'mind' is an indispensable name for the spiritual activities of the organism. Similarly the student was warned not to think of *horme* and *mneme* as things, but simply as characters pervading the 'body-mind's' activities. This attitude is in accord with a general tendency in modern science, which thinks less and less that its business is to search out the hidden

¹ In Burt's records, the points representing the ideal extravert or introvert are not joined directly. Horizontal lines of equal length are drawn through each, and their ends are joined to those of the line above or below by vertical lines. Thus the two graphs have the outline of staircases in which the steps are of equal breadth but unequal height. This arrangement conduces to clarity.

² G. H. Thomson, who has often criticized this theory and the features of Spearman's doctrine that go with it, has nevertheless given a vivid and attractive illustration of its effectiveness as an expository conception. (*The Factorial Analysis of Human Ability*, pp. 49–50.) Thomson's alternative theory (the 'sampling theory') is fully expounded in the same book.

material causes of events. Bertrand Russell gave epigrammatic expression to this tendency when he declared that 'electricity is not a thing; it is a way in which things behave.' The same thing had been said many years earlier about heat—which most chemists in 1800 deemed to be one of the chemical elements ('caloric') but which the Victorian physicist Tyndall lectured upon as 'a mode of motion.' We need not multiply illustrations of an idea which Einstein's famous theories have made widely familiar. It will be enough to say that, in accordance with it, factors are not things but only characters of human activities—some, like g and 'general emotionality' widely pervasive, others characters of narrower scope. Some day we may learn much more than is at present known about their association with factors in the bodily constitution. Meanwhile their value lies in the contribution they make to the general picture of human nature and to the wise and just treatment of the capacities and weaknesses of young life.¹

NOTE A. *Normal Distribution*

The calculations on p. 134 *et seq.* were made with the help of the Table of the Probability Integral on p. 84 of J. B. Dale's well-known *Mathematical Tables*. For our purpose the equation at the head of the table may be taken as describing a normal curve, covering 2 units of area and representing the distribution of an endless number of measurements (*e.g.* of I.Q.) whose standard deviation (σ) is $1/\sqrt{2}$ or 0.707. The value of the integral for 0.707 lies between 0.6778 (for 0.7) and 0.6847 (for 0.71), and may be taken to be 0.68. This means that the measurements whose deviations do not exceed σ are included in an area of 0.68 units—that is, that they are 34 per cent. of the whole. The number whose deviations exceed σ must, accordingly, be 50 per cent. — 34 per cent., *i.e.* 16 per cent. If (as in the first example on p. 134) the deviation is 1.38 σ , the table must

¹ In spite of what has just been said, it would be vain to expect workmen not to speak of electric power as 'juice' or gas companies not to offer 'therms' for sale as if they were tangible articles. And a psychologist who forbade us to say that a man 'has' a good memory or a bad temper would justly be scouted as an irritating pedant. 'Reification' (thing-making) is too deeply rooted and too useful a habit to be eradicated.

be entered with the 'argument' 1.38×0.707 or 0.976 . The corresponding value of the integral is about 0.832 or about 41.6 per cent. of the total area. Hence the number of measurements whose positive deviation is not greater than 1.38σ is 41.6 per cent. of the whole, and the number which exceed that limit is 8.4 per cent. The same process applies, of course, to negative deviations.

NOTE B. *On the Formula for Correlation*

Let x and y be the standard scores of a particular person in two subjects and let N be the number taking the examination.

Since $(x - y)^2 = x^2 - 2xy + y^2$ it follows that

$$2xy = x^2 + y^2 - (x - y)^2$$

with a similar equation for each of the other candidates. Hence, if we add the N equations together, we obtain

$$2 \sum xy = \sum x^2 + \sum y^2 - \sum (x - y)^2$$

where $\sum xy$ means 'the sum of all such products as xy '; and so on.

Now, since x and y are standard scores, the sum of their squares for all candidates is in each case N . Hence we have :

$$2 \sum xy = N + N - \sum (x - y)^2$$

or

$$\sum xy = N - \frac{1}{2} \sum (x - y)^2$$

But, whatever the values of x and y may be, the value of $(x - y)^2$ must be positive, and the sum of all such values must also be positive. So it follows that $\sum xy$ must always be less than N unless $x = y$ for every candidate. In that case $\sum xy = N$.

NOTE C. *The Law of Regression*

Let x be the common standard score in algebra of a particular group of the persons tested. Then our object is to find the score in geometry about which their standard scores in that subject will cluster most closely. Let it be called px , and let y be any one of the geometry scores. Some of these will exceed px , others will fall short of it; our precise aim will, accordingly, be to find the value of p which makes the sum of the squared differences $(px - y)^2$ as small as possible when it is taken over the whole range of the scores.

Since x and y are standard scores the sums Σx^2 and Σy^2 are both equal to N (as in Note B). Hence :

$$\begin{aligned}\Sigma(px - y)^2 &= p^2 \Sigma x^2 - 2p \Sigma xy + \Sigma y^2 \\ &= p^2 N - 2p \Sigma xy + N\end{aligned}$$

This equality will not be disturbed if we add $(\Sigma xy)^2/N$ to the right-hand side of it and also subtract the same amount at the same time. We thus obtain :

$$\begin{aligned}\Sigma(px - y)^2 &= \left\{ p^2 N - 2p \Sigma xy + \frac{(\Sigma xy)^2}{N} \right\} + \left\{ N - \frac{(\Sigma xy)^2}{N} \right\} \\ &= N \left(p - \frac{\Sigma xy}{N} \right)^2 + N \left\{ 1 - \left(\frac{\Sigma xy}{N} \right)^2 \right\} \\ &= N(p - r)^2 + N(1 - r^2)\end{aligned}$$

since, by definition, $\Sigma xy/N$ is the correlation, r . Now, all values of $(p - r)^2$ being positive, it follows that $\Sigma(px - y)^2$ is least when $p = r$. It is then $N(1 - r^2)$ or, on the average, $(1 - r^2)$ per person. Thus as r approaches unity the scores in geometry cluster more and more about the value rx . For perfect correlation they coincide with it.

NOTES ON BOOKS, ETC.

C. SPEARMAN, *The Abilities of Man* (Macmillan, 1927), is the classical work on the subject of this chapter. L. L. THURSTONE, *The Vectors of the Mind* (Univ. of Chicago Press, 1935), may be contrasted with it as a thorough exposition of the modern 'factorist' doctrines and methods. G. H. THOMSON, *The Factorial Analysis of Human Ability* (Univ. of London Press, 1939), is a lucid review and valuable critique of the whole field, intended for readers of small mathematical equipment. C. BURT, *The Factors of the Mind* (Univ. of London Press, 1940), combines philosophical acumen and psychological insight with practical wisdom drawn largely from the writer's unique experience as psychologist to the London County Council. His earlier *Distribution and Relations of Educational Abilities* (King and Son, 1917) urged the need for a theory of 'multiple factors', and gave the centroid formula, since freely used by Thurstone and others. For further illustrations of factor analysis as applied to educational problems the student should consult recent issues of the *British Journal of Educational Psychology*.

CHAPTER XI

Mimesis

Looking back upon the course of the argument to this point, we shall recognize that in *horme* and *mneme* we studied the two basal and all-pervading characters of bodily and mental life, and in the routine tendency and play two of their most general modes of manifestation. In the last two chapters we have contrasted the influences of environment and endowment upon the child's development, and have studied some of the more important items of which endowment consists. We have now to make our study more concrete by observing the way in which environment and endowment play their respective parts in shaping the life of the young. To do this we must give consideration to two further deep-rooted tendencies in human nature. One is the general tendency to *imitation* which, under the name of *mimesis*, we shall at once discuss. The other is the tendency to follow certain specific lines of activity—a tendency which we shall subsequently consider under the name of *instinct*.

Mimesis (*μίμησις*) is to be understood as the general tendency shown by an individual to take over from others their modes of action, feeling and thought. It ranges widely through the animal kingdom, and its effects are so subtly interwoven with those of specific heredity that the two are hard to disentangle. The present tendency is to give to it more weight than it formerly received. For instance, in accounting for the resemblances in material and social culture so often found between widely severed communities, present-day anthropologists appeal to 'culture-spread' rather than to 'evolution' based upon similarity in endowment.¹ And it seems that even among lower animals the rôle of *mimesis* has been underestimated. Young chicks and pheasants are often first set pecking and drinking by the example of their seniors or more adventurous com-

¹ See W. H. R. Rivers, 'The Ethnological Analysis of Culture' (*Report of the British Association for 1911*, p. 490). Elliott Smith was the English protagonist of the doctrine of culture-spread.

panions, and jungle pheasants and young ostriches are said to perish of hunger in the absence of this natural stimulus to pecking, or of such a colourable copy of it as an experimenter can give by tapping with a pencil.

As the foregoing examples suggest, mimesis may involve widely differing levels of purpose or intention. Conscious intention may be entirely absent, as when a chick pecks or drinks simply because his neighbours do so. This is bare mimesis—mimesis at the lowest level. But a clear intention may be present, as in the historic attempt of Japan to remodel her life upon Western lines. Here we speak of 'imitation.' Thus imitation bears to mimesis the same relation that conation bears to hormone and memory to mneme. In all three pairs the Greek term describes a general feature of human and animal behaviour, and the corresponding Latin term is limited to those instances in which the activity is conscious.¹ In human behaviour the two types pass into one another by insensible gradations. Let us consider a simple instance. A little girl, released with her comrades from lessons, runs if they run, and joins in chasing and being chased just as a young dog would do in comparable circumstances. This is mimesis, pure and simple, involving no trace or only a minimum of deliberation. If her special friend, who has learnt the art of 'tripping,' breaks into that mode of progression, she will be sure, sooner or later, to copy the movement, reproducing it at first clumsily, but in time with ease and grace. Here there is an element of deliberation; for tripping, though a simple variant of running, is not in the same sense a natural movement, and cannot be imitated without a certain amount of attention to its details. Now, suppose the child, a year or two older, to see her elders skipping with a rope. If she, too, is to skip, as she certainly will, she must give more attention than in the last case to the pattern or 'idea' of the movement; for it is at once more artificial and more complicated. This is still more necessary when, at a later age, she takes part, say, in a figure-dance in which an elaborate scheme of movements is to be carried out by a group of performers. To apprehend the pattern of the dance, to retain it in mind, and to

¹ Lloyd Morgan distinguishes the two levels of mimesis by the terms 'biological or instinctive imitation' and 'reflective imitation.' Valentine restricts 'mimesis' to the lower level.

translate into continuous and nicely adjusted action the part assigned to her, will demand the intelligent exercise of intellectual powers as well as mastery of the constituent movements. Mere mimesis has here passed unmistakably into true imitation.

We have now material for observations on two important points. The first is the relation of mimesis to endowment, the second its relation to 'original' behaviour.

It is evident that in mere mimesis the action copied is simply a stimulus which releases in the copier a train of activity already prepared. A chick standing in water would not for the first time drink when it sees its mother drink, a child for the first time seeing another run would not run, unless the engram-complexes involved in drinking or in running were already established in the disposition. As mimesis rises towards the level of conscious imitation this statement must be modified. There is, for instance, no innate engram-complex waiting to be released in the form of skipping; skipping must be *learnt*. At most there is an innate disposition to be interested in behaviour of this kind, to be attracted to it as a mode of self-assertion. Nevertheless, all the elements of the artificial movement are rooted in nature. What happens in learning to skip is that these elements are brought into relations to which nothing in the original engram-complexes corresponds. The child, faced by a situation that impels to action, will be urged to a number of movements, more or less relevant, from which, by trial and error, the proper sequence will eventually be selected. Once selected, it becomes fixed and perfected by 'consolidation' (p. 54). The process clearly implies in the child a power to apprehend the pattern or idea of another's action and use it as a guide for her own. That power consists in her ability, first, to apprehend the elements of the pattern as corresponding to actions she can already perform, and, secondly, to apprehend the elements in their relations as forming a significant whole.¹ The pattern having been apprehended, the

¹ Animals have both these powers, but in a much lower degree. They can *discriminate* or pick out elements in a complex, and they can *synthesize* or recognize unity in diversity; for these accomplishments are involved in all response, whether instinctive or intelligent, to changes in the environment. But the range of their discrimination is limited, and their power of synthesis more so; and they cannot, except the more intelligent ones and in simple cases, carry a pattern 'in the head.'

child strives to set up between the movements of which, by hypothesis, she is already mistress, relations corresponding to those they have in the model. This can be done only by trial and error, the process being constantly checked by comparison with the action imitated, and guided by the applause of the onlookers. In this way an engram-complex is finally set up which makes skipping practically automatic. Later this complex may itself function as an element in a still more complicated movement—for example, a skipping dance; or may furnish organized components—such as rhythmic leaping—to an action that does not involve it as a whole.

The acquirement of speech is the most important instance of these principles in action. Valentine notes that two of his children, a month after birth, uttered sounds in response to his 'cooing' and 'crooning,' and that a third did so a couple of weeks later. He is careful to offer 'no suggestion that at this stage the baby makes an effort to produce a similar sound, or is even aware of any resemblance. We are simply stating that sound-making elicits sound-making, an innate and relatively specific type of response.'¹ This was bare mimesis and did not rise to the higher level until the end of the first year, when the children began not only to imitate definite words, but also to use them to express feelings or refer to objects.² At this stage children repeatedly practise their new acquisitions so as to gain fuller mastery and enjoyment of a fresh type of experience.

A primitive syntax appears about the beginning of the second year, when two words or even three may be conjoined to express a fact or a desire—a syntax which seems to be in part imitated spontaneously and in part shaped by instruction or invented *ad hoc*.³ From this stage a clever child will often make astonishingly rapid progress towards a speech which, on its own simple level, is fluent, clear and grammatically correct—a ready and adequate instrument for expressing anything within the compass of his interests. It would be hard to distinguish the contributions made to this advance by unconscious mimesis, self-guided imitation and imitation guided by instruction. It is clear that intonation—the tone-curve of the

¹ Valentine, p. 188.

² Compare the way in which the innate power of apprehending a face as an object develops into the ability to distinguish and remember particular faces (p. 48).

³ For examples see Valentine, p. 422.

sentence—and the accents that characterize 'standard' English and the regional dialects are almost bare mimesis; but a vast amount of intelligent and adaptive imitation also goes into an achievement which, though commonly taken for granted, is almost always matter for surprise and admiration, and is made possible only by the little linguist's insatiable keenness and indomitable persistence. From the psychological standpoint, one of its most noteworthy features is the readiness with which a child brought up in a bilingual atmosphere will express himself alternatively in both languages—like a musician who can play the same air in different keys or upon widely different instruments.¹

The connection between imitation and 'originality' has much importance for education. Teachers of a modern tendency sometimes discourage imitation on the ground that it 'cramps self-expression.' This is a mistake. The most original minds find themselves only in playing the sedulous ape to others who have gone before them along the same path of self-assertion. In his earlier works we cannot distinguish even the voice of Shakespeare from the voices of his contemporaries. Imitation is, in fact, but the first stage in the creation of individuality, and the richer the scope for imitation the richer the developed individuality will be. Some corollaries of this truth are obvious; for instance, that children should be introduced through books to a wider and better company than they will meet in actual life. Others require more emphasis. There is a positive danger in the current idea that individual teaching requires as its correlative small groups of pupils. On the contrary, the more store we set on letting the child go his own way, the more desirable it is to widen the field for imitation. Clever and enterprising children help the duller and less adventurous to discover their own powers by showing them what can be done, and by

¹ During the war the mother of an 'evacuated' child of 7 recorded that her son had acquired three distinct languages: (1) the provincial dialect of the village children, (2) the Cockney talk of children sent to the same village from a poor quarter of London, (3) the polite English he used when playing with the doctor's daughter. He never mixed them but spoke each with perfect fluency upon its due occasions. The village children and the little Cockneys would not be able to speak polite English but would no doubt understand it; one's 'passive' is always greater than one's 'active' vocabulary.

awakening emulation. The group should, then, be as large as possible, subject to the condition that the teacher can give attention to individual progress and needs, and is not driven to use the authoritarian methods that quench the tendency to imitate. This condition is vital. Any attempt to compel imitation tends to defeat its end by provoking an attitude of resistance or indifference—a fact which explains the failure of many well-meant efforts to make young people admire the proper things in literature, art and conduct. We must add that this ‘contrariant’ attitude, which is a protest of the individual against infringement of his autonomy, will be maintained with special stubbornness towards any teacher who is foolish enough to claim, consciously or subconsciously, to be accepted as himself (or herself) a model for imitation.

We commenced this chapter by saying that mimesis shows itself in action, feeling and thought. These factors of conscious life are so closely bound up with one another that mimesis, beginning in one, commonly spreads to the others. Thus, among girls, imitation of an admired mistress, which may begin with copying her handwriting, her turns of speech and her coiffure, often ends in a wholesale adoption of her sentiments and opinions. The admirer tends to become like the model, so to speak, all through. Anything that obstructs mimesis in respect of one of the factors tends to hinder it in the others. We do not usually adopt the accent or dress of a person we dislike, or feel deeply moved by the joys or sorrows of one whose opinions on important matters clash with our own. Thus it is difficult to say whether the difference in speech between different social classes is more a cause or a consequence of the divergence between their interests; in either case it is a formidable barrier between them.¹ The primary schools can help the cause of social solidarity in no more practical way than by working to raise the standard of speech among their pupils, so that we may become a people who have at least the first requirement for mutual understanding—a common language.²

¹ Bernard Shaw's play *Pygmalion* is a sermon on this text.

² This argument does not point to the suppression of regional dialects where they have form and vigour as well as being racy of the soil. On the contrary, a common love for a native accent and idiom may often be a powerful bond between social classes.

In so far as mimesis affects feeling it leads to 'fellow-feeling' or sympathy in the strict meaning of the word. Here it does its most important work, for feeling, as we shall later see, is deeply involved in thought and action. Much has been written on this theme, especially by certain French authors under the title 'the psychology of the crowd.' It is community of feeling that converts a mob of unrelated individuals into a body moved by a single will, capable of heights of heroism and depths of villainy to which few of its members, acting alone, could rise or fall. The demagogue and the electioneering agent base their tactics on the psychology of the crowd, as does the newspaper man who can make a million readers follow his political gyrations without the least awareness of inconsistency. The fellow-feeling that makes these things possible is the foundation of all *esprit de corps*, whether in a nation, an army, or a school.

The social functions of imitation were discussed in a highly instructive study by Graham Wallas, and later, on a stricter scientific level, by McDougall and Freud.¹ McDougall bases his psychology of the group upon the 'direct induction of emotion' which we have just described as mimesis in the province of feeling. Whenever people are gathered together emotional states—for instance, states of fear or hilarity—arising in individuals are apt to spread by induction throughout the whole body. The crowd then ceases to be a mere crowd or mob, and takes on some of the distinctive features of a group, as when strangers who have joined in laughing heartily at the same comedian feel for the while a general kindness towards one another. There are, however, important differences between a casual group and the highly organized type—such as a regiment, a historic school or a nation—that has enjoyed a continued existence, has inherited traditions and settled customs, possesses a common consciousness based upon some appreciation of itself as a whole and of its distinction from other groups, and exhibits a definite social structure. A group of this kind may be a vehicle of common ideas as well as of common feelings, and so may raise notably the quality of the intellectual activities of its members. A

¹ Graham Wallas, *Human Nature in Politics* (Constable, 1908); W. McDougall, *The Group Mind* (Cambridge Univ. Press, 1920); S. Freud, *Massenpsychologie und Ich-analyse* (1921), translated under the title *Group Psychology and the Analysis of the Ego* (Hogarth Press).

voluntary association of persons ensuing some common interest, such as a political or social club, a joint-stock concern, or the personnel of a government office, is another type of group whose influence upon the behaviour of the individual members is less marked but may still be very important.¹ But the poorly organized crowd, as the French writers insist, always tends to reduce individual mentality to a lower intellectual level.

Freud accepts McDougall's direct induction of emotion as a fact, but disputes his view that it accounts for the beginnings of group-organization. He points out, on the one hand, that unless people are already united in the bonds of a group the exhibition of a particular emotion by one of them often leads not to its acceptance, but to its conscious rejection by others—as when a 'highbrow' refuses to be amused by a joke which tickles the groundlings. On the other hand, he argues that the panic terror which for McDougall is the arch-instance of emotional induction is not a group-phenomenon. The danger which causes a *sauve qui peut* will be disregarded by soldiers as long as they remain truly a group; it operates only when the bonds of union have already begun to dissolve. The group formation must, then, have some other basis than the induction of emotion.

Freud finds the basis of his own theory in a conception which is entirely of a piece with his general psychological scheme. For him a group is, so to speak, a family writ large, and the bonds that hold its members together are the bonds which unite children to their common father and to one another. Those bonds appear early in infancy and their forging makes possible the child's escape from the self-centred state which Freud calls 'narcissism.'² The child finds in his father an object which draws his love outwards and at the same time becomes the (unconscious) ideal of his self-development. In this sense he may be said to identify himself with his father. With his brothers and sisters there is also identification, but of a different and, so to speak, of a lower order. It is an identification with the child's actual not his ideal self, a limited identification

¹ Cf. Mannheim on the distinction between communities and associations (*Man and Society*, p. 289).

² This term is taken from the Greek myth of Narcissus, the youth who died of love of his own image reflected in a fountain.

which leaves room for quarrels and competition and depends upon the common relation of all the children to the father and to their strictly equal status before him. From this point of view the typical group is McDougall's stable group with a definite leader. Other groups derive their character from that type; for instance, any group whose stability does not depend upon a living leader must put in his place some idea (such as the fatherland or 'the old flag') which it can easily personify and invest with a halo of idealism.

Freud's theory certainly illuminates the ordinary relations of school pupils to one another and to the authorities, but it needs elaboration to include all the phenomena of union and of leadership which are met with in school life. In normal circumstances the teachers are accepted as leaders as a matter of course, and become a chief source of those influences which make up the discipline and 'tone' of a school. But there are always other subordinate leaders. Of these some are regular officers of the community, holding their positions by election or nomination; but others are unofficial leaders of small groups who may crop up wherever two or three are gathered together, and are to be found in every school and class. Every teacher must meet them, either as friends or as foes. Where the conditions of work and government are healthy, they will generally be friends of the constitution, and are in that case its most useful upholders. But conditions are not always healthy; and even where they are, malignancy may lurk, an inheritance from less happy days. In such a case the teacher should deem it an important matter to discern who are the natural leaders—for they are not always visible to the eye—and, if possible, to capture their loyalty and interest.¹ Where they are obstinately intractable there is only one safe policy left. He must suppress the enemies of peace, *vi et armis*. But let him be sure of his ground before he strikes, and above all, remember that the weakest thing to do is to attack an insignificant follower and let the real leader of revolt go unscathed.

It is an obvious corollary that no school group can be in a healthy moral condition where there is lack of community of feeling between teachers and pupils. To secure it the teacher must preserve within

¹ Most experienced teachers have stories of dangerous rebels converted into upholders of authority by a timely use of the principle that an ex-poacher makes the best game-keeper.

his adult being a genuine sympathy with the tastes and enthusiasms of youth. It is not enough to affect such a sympathy ; for no weakness is more unerringly detected than insincerity in feeling, and nothing leads so surely to distrust and aversion. The person, however much devoted to the work of education, who finds that nature has withheld from him this gift of perpetual youth, should transfer his labour to another corner of the vineyard.

Feeling-spread is almost wholly 'biological' imitation or bare mimesis. Some actors, it is true, aver that by throwing themselves into a part they can deliberately create within themselves the emotions they outwardly portray ; and it is certainly often possible, in moments of agitation, to acquire something of the coolness of another by imitating his calm demeanour.¹ But these facts merely show that biological imitation of a feeling is facilitated by action congruent, and hindered by action incongruent with it. Speaking generally, we catch from others, without reflection, their gaiety, their enthusiasm, their terror, or their depression. In thought, however, as in physical movement, both types of mimesis are common. Any attempt to understand a statement or an argument, as in following an historical description or in learning a proposition in geometry, may be regarded as a case of reflective imitation ; for the essence of the process is that one seeks deliberately to see through the eyes or think the thoughts of another. The mimesis is of the lower type when the adoption of another's ideas is unwilling ; and this is generally called *suggestion*. Suggestion was first studied by the hypnotists ; for one of the chief marks of the hypnotic state is that the subject accepts readily almost any idea that is offered to him.² It was afterwards found to be a common factor of normal life, and has been made the subject of numerous experimental investigations. The following experiment is typical of the work initiated in this department by Binet.

¹ According to the celebrated 'James-Lange theory,' an emotion is only the 'backwash' from external and internal movements ; 'we feel sorry because we cry, angry because we strike, afraid because we tremble.' If the theory were true, reflective imitation of feeling would be comparatively common and easy. Most psychologists, however, regard James's view as greatly exaggerated.

² The reader will see that this fact brings hypnosis as well as ordinary suggestion under Freud's theory of identification.

The present writer once interviewed, one by one, a number of boys and girls of ten, and, in the course of a friendly conversation, showed each one a postcard-photograph of a yacht sailing alone on Lake Geneva. After a child had examined the card for thirty seconds, a number of questions about it were addressed to him, among them the question: 'Was the steamer going in the same direction as the yacht or in the opposite direction?' Only one or two children out of about twenty wholly rejected the suggestion contained in these words, and declared bluntly that they had seen no steamer; some showed signs of disturbance, as if ashamed at their carelessness in perception or their lack of memory; some gave a hesitating answer; but quite a number specified with apparent confidence the direction in which the supposititious steamer was moving.

Whatever the full interpretation of such phenomena may be, they throw an interesting light on the suggestibility of children when questioned by an adult, especially by one whom they do not know or to whom they are in the habit of deferring. They have an obvious bearing on the practice of class-questioning, and on the value of evidence extracted from children either in connection with school crimes or in a court of law.¹

Suggestion is a potent factor in the general life of society. Malicious gossip and slanderous suspicion live upon it (let the reader consider how it works here), and it accounts largely for the rise, spread and vitality of public rumours. To see how powerful it may be when 'feeling-spread' has created a favourable atmosphere, one need only recall the classical instance of the mythical 80,000 Russian troops to whose presence in Great Britain during the autumn of 1914 thousands of honest people gave convincing testimony. No event could bring out more clearly the intimacy of connection between suggestion and feeling; the wish was indubitably the father of the thought. It has, again, an enormous field in the art of advertisement, which may make all but the wariest of us act much as the old lady did, in William James's story, when she pressed her shopkeeper for a certain article 'because the advertisements speak so well of it.' The salesman who persuades you to buy something

¹ There is now a considerable literature dealing from the legal standpoint with the suggestibility of children and adults.

you do not need and do not want is an expert in a kindred line of suggestion. He does not seek to subdue your 'sales-resistance' by direct assault, but by subtle arts insinuates the idea that so intelligent a person as yourself cannot dream of neglecting the chance of so desirable a purchase. You fall; and repentance comes only when the mists of suggestion have cleared and the true outline of the affair becomes visible.

Suggestion appears in a more serious light when one sees that it has been the main prop of superstition in every form and in all ages. There was never, for instance, a scrap of objective evidence to support the belief in witchcraft; yet the fantastic faith once prevailed even in sober England from the learned King James I down to his most ignorant subject. It passed from mind to mind like a contagious disease that could be stayed only when at length challenged by critical reason, and it still lurks in the dark corners of societies to which that sanative influence has not penetrated. In our own country there is now a regrettable equivalent in the revived belief in astrology and other modes of 'occultism.' Here, as with witchcraft, undisciplined hopes and fears prepare the soil and suggestion sows the seeds of faith. The seeds flourish largely because the suggestion comes in a pseudo-scientific guise and this fact lights up a very weak spot in the education of our people; for it shows that although science has become a work of magic power it has as yet done sadly little to fortify the general mind.

With the development of wireless telephony what is called 'propaganda' has come to play a part, always important and often decisive, in shaping the prejudices, opinions and passions of vast masses of men. The word should mean 'an organization for disseminating new doctrines or making proselytes,' but is now more often applied, not to the disseminating source but to what issues from it—and carries the subsidiary notions that this is intended to persuade and is probably untrue. The last assumption is unfair.¹ A propagandist, in his effort to persuade, may simply state what he believes to be true and leave it to speak for itself. In that case suggestion enters only indirectly, in so far as well-tested confidence

¹ The Roman 'Congregatio de propaganda Fide,' in whose title the word was first used, was founded (1622) to disseminate what a committee of cardinals held to be truth.

in the veracity of the source may dispose hearers to accept its pronouncements without evidence or argument. The propagation of false beliefs calls for a more direct and robust use of suggestion ; and the devices are many and subtle by which it seeks credence and too often wins it.

The course of events in Germany since 1933 showed in a way the world can never forget nor study too seriously the enormous effects propaganda may have when used on a vast scale and with ruthless persistence to indoctrinate a whole nation. The creed of National Socialism appears to the democratic mind so plainly unreasonable and inhumane that open discussion of it must have led to widespread scepticism of its truth and value. But, on the one hand, open discussion was never permitted, and on the other hand a community whose social relations and established institutions have been shattered by events and reduced to chaos will always be ready to accept a new scheme of life which promises deliverance and security—especially when its violence accords only too well with the temper of the uprooted masses to whom it makes its chief appeal.¹

The greatest success of this propaganda was in the field of education where, as is well understood, it created within a few years a new type of citizens fanatically imbued with the ideas of the regime which had bred them.² To find a remedy for this fearful disaster is one of the gravest problems facing civilization.

To assume that the German use of suggestion has no parallels in the schools of democratic lands would be to nourish an illusion. The grand difference between the cases is that in a totalitarian state the influence is deliberately imposed from above by authority and is kept immune from competition and criticism, but in the democratic community seeps into the schools (one might say) as a largely uncontrolled emanation or infection from the national institutions and the nation's traditional habits of life, thought, and aspiration. English schools, for instance, show an extraordinary variety in aims and methods, serving the supposed interests of widely different social classes, and expressing sometimes highly individualized con-

¹ See K. Mannheim, *Man and Society*, p. 129 *et seq.*

² See G. Ziemer, *Education for Death : The Making of the Nazi* (Constable, 1942) and F. A. Cavenagh's illuminating discussion of Nazi education in the *Journ. of Education* for July, 1942.

ceptions of educational aims and activities ; yet it would be hard to find one where the broad elements of a distinctive English *ethos* are not plainly visible. This is because the school, under democratic conditions, is a microcosm in which the deeper strains of the national life are freely reflected, and because the teachers, humdrum professionals or inspired eccentrics, equally with the general body, are, consciously or unconsciously, vehicles for transmitting these to their pupils.¹

Candid consideration of these and other facts will show that suggestion plays an immense part in the intellectual life of us all. By what other agency could we account, for example, for the geographical distribution of religious beliefs and distinctive political faiths ? The fact that convictions upon such matters have frontiers almost as clear as those of States does not prove that ' reason ' plays no part in their maintenance. But it does prove that, with regard to the things that have most power at once to divide men and to unite them, the function of reason as we find it actually at work is not so much to discover truth, as to clarify, confirm and explore some faith of our fathers which we have received by suggestion. The great Burke, who ' chose his side like a fanatic and defended it like a philosopher,' only followed in a grand manner the common habit of mankind.

It would be a profound error, then, to look upon suggestibility as nothing but a deplorable weakness in human nature. Like the routine-tendency and the play-tendency, it is a biological device of the greatest utility in both individual and social life. Without question, man's ultimate aim should be to order all his affairs, in conformity with reason. But life cannot be suspended until that ideal has been realized ; and by suggestion the people obtain meanwhile at least the partial vision without which in literal truth they would perish.

¹ In the violent social upheavals on the European continent some see a warning that the stability of the English tradition may not be eternal, and that more direct means may be needed to preserve, through education, its vital features. See Sir F. Clarke, *Education and Social Change*, 1940, pp. 1-5, and elsewhere. The United States found it necessary to introduce definite measures for ' Americanizing ' the enormous flood of alien children who entered their schools during the great days of immigration, and thus preventing national disintegration.

These considerations will help a teacher to decide one of the thorniest questions of professional ethics—namely, the use he should himself make of suggestion. Let him note, in the first place, that he can no more avoid acting on his pupils by suggestion than he can make himself invisible as he perambulates the classroom. In the second place, let him remember that suggestion is not by nature a foe to spontaneity, but a necessary instrument in the process by which a man wins control of his own nature. From the former truth it follows that the teacher is as much entitled to influence his pupils by suggestion as they are to influence one another, provided he does not deliberately impose such influence upon them, but simply puts his superior knowledge and experience of life into the common stock from which the growing minds of his little community may draw each what it needs. From the second truth we deduce that the teacher's suggestive power, so far as it can be controlled, should aim at building up gradually the critical truth-seeking habit, without which man's mind would be everywhere in chains. With this end in view the teacher is not only entitled but bound to use suggestion, either directly in his personal teaching, or indirectly through the medium of well-chosen books, as the best means of revealing the ideals of reason.

Do these principles suffice to determine the teacher's proper attitude towards debatable questions of faith, morals and politics? We reply that they not only permit but require him to see that no child shall lose, through lack of opportunity, the inspiration of ideals sanctioned by the best and widest experience of mankind. They indicate, further, that with boys and girls who have reached the eager years of adolescence, free discussion of these matters, whenever they naturally arise, is the best prophylactic against unhealthy suggestion—the suggestion that is propagated in passion and prejudice, and fructifies where ignorance is artificially maintained and honest inquiry is stifled.¹ By means of such debates, conducted in a serious spirit, tolerantly, and so that each view is fairly presented, young minds can most safely discover those deepest

¹ Some teachers deem it useful to encourage in class the examination of 'tendencious' news and propagandist articles in newspapers—not in order to foster any brand of partisanship, but to make their pupils aware of the suggestive elements in such documents.

impulses of their nature upon whose guidance they must ultimately rely.

NOTES ON BOOKS, ETC.

A sound and broad treatment of imitation is given in W. MITCHELL, *Structure and Growth of the Mind* (Macmillan, 1907). For biological imitation see C. LLOYD MORGAN's delightful *Animal Behaviour* (Ed. Arnold, 2nd ed., 1915). M. W. KEATINGE's valuable book, *Suggestion in Education* (Black, 1907), includes an account of Binet's experiments. G. LE BON, *The Crowd* (English trans. published by Fisher Unwin), is a popular treatise which must be read with caution. For works by WALLAS, McDUGALL and FREUD, see p. 159 (footnote). VALENTINE's observations on imitation in young children are given in Ch. X of his book.

CHAPTER XII

Instinct

We must now inquire what is the origin of the activities into which the child is born and which he is destined to make his own. Is the rich life of the modern world merely the long result of imitation modified by the free creative efforts of each generation? Or are there, apart from mimesis, forces in human nature which determine fixed lines along which our activities must flow and which even free creation must follow?

At this point, if anywhere, it should be profitable to seek help from the 'biological view' of human life. Adult activities are so complicated that they may easily defy direct analysis, and the behaviour of children is soon so much influenced by imitation of their elders that deductions based on it may be misleading. But the higher animals, such as the dog and the ape, lead lives that are in many respects simplified models of our own, and there is no doubt that a large part of their behaviour *can* be analysed into a moderate number of modes of self-assertion, persistent not merely during the life of the single animal, but through countless generations. We are familiar with them under the name 'instincts.' It is at least reasonable, therefore, to inquire whether we have not carried those modes of behaviour, or some of them, upward with us in the course of our evolution and whether they are not still the basis of our complex existence. And if it is so, may not the comparative unfruitfulness of much educational effort be largely due to neglect of these proximate sources of human energy—the real springs of educational progress both in conduct and in learning?

In following up this idea we must not be misled by the associations of the term 'instinct.' Most people in thinking of instinct have in view the often marvellous ways in which animals perform complicated acts they have never learnt for the attainment of ends they are incapable of foreseeing or understanding. Creatures, such as insects, whose lives are ruled by instincts of this kind, are wonderfully well equipped to meet the normal problems of their lives, but

may display what Fabre called 'abysmal stupidity' when faced with an emergency for which the routine of the instinct does not provide. That is why instinctive behaviour is commonly regarded as 'mechanical,' 'blind,' and the extreme opposite to 'intelligent' behaviour; animals, it is said, are guided by instinct, man by reason.

This popular view reappears, on the heights of metaphysics, in Henri Bergson's famous theory of creative evolution. Here the seeds of instinct and intelligence are thought of as commingled in the earliest forms of mind, but as evolving through the ages along widely divergent routes. The insect tribes have, so to speak, committed themselves almost wholly to instinct; their activities are determined by their structure and are set in motion by a direct apprehension of reality, called by Bergson 'intuition.' The vertebrates, following the other line, have exploited the intelligence that reaches its highest level in man's logical powers and capacity for 'looking before and after.' But a certain adaptation to circumstances shows that the insect mind is sometimes lit by a gleam of intelligence, while instinct has obviously an important place in vertebrate life. That is why, among men, intuition reveals—say to a mystic or to a lover—things that the plodding ways of intelligence could never reach.

Metaphysics apart, Bergson's view seems justified by observation. It is true that a few contemporary psychologists virtually deny that instinct has any place in human behaviour—on the two grounds that it is infinitely varied and plainly fashioned by external influences. But to maintain this position without compromise they must adopt the preposterous idea that even sexual behaviour,¹ though admittedly inherited in animals, is in man entirely the result of imitation and 'evil communications,' and must account by similar explanations for mother-behaviour and the newborn infant's behaviour when terrified or hungry. If ordinary observations are held to be insufficient to rebut this theory, it seems to be refuted beyond doubt by careful studies of the childhood of animals, such as those of Sir P. Chalmers Mitchell, invoked by Burt, and of Professor and Mrs. Kellog, who brought their child up for some months in company with a baby-ape of about the same age. These studies give per-

¹ Through which, as Lucretius wrote, *genus omne animantum concipitur visitque exortum lumina solis.*

suasive evidence of congruity between the earliest stages of the child's life and the animal's. And can anyone who has lived with friendly and intelligent dogs, sharing their serious interests and their play, doubt that this congruity may remain real and active? In short, it seems clear enough that instinctive behaviour akin to that of the higher animals plays at least some part in the life of man and enters into some of his fundamental activities.

An instinct was formerly held to be a piece of complex neural and muscular machinery that, when touched off by a particular kind of stimulus, would act in a manner determined by its structure. This is substantially the view of the behaviourists;¹ but psychologists who are not bound by their dogmas hold that its essence is a hormic 'drive' into whose service all an animal's powers may be drawn—its intelligence as well as any motor skills it may have inherited or acquired. This opinion may be condensed into the statement that an instinct is an innate determining tendency.² To speak of it thus implies that it is a directing influence initiating and controlling behaviour much as it is initiated and controlled by determining tendencies acquired in experience (see p. 43). The activities issuing from it may follow a relatively fixed pattern (the constructive work of beavers and birds offer typical examples) or may, almost from the beginning, be plastic and variable, being moulded and even transformed by the circumstances in which they unfold. Human instincts are generally of the second type, and that is why their nature may be misunderstood. For instance, there is a vast gap between a child's restless curiosity and crude 'experimentation' and the disciplined interest and trained skill of a chemist or a physicist; but it is bridged by a continuous development from the one stage to the other. And this development is ruled by determining tendencies which, though constantly modified by the results of their own activity, never cease to draw their

¹ Watson defines instinct as 'a combination of explicit congenital responses unfolding serially under appropriate stimulation.' (*Psychology from the Standpoint of a Behaviorist*, p. 231.)

² In the earlier editions of this book (1920, 1930) it was pointed out that instincts may be thought of as innate determining tendencies. C. S. Myers put forward the same idea independently in the *Brit. Journ. of Educ. Psych.* for Nov. 1942, where he elaborated it in an illuminating contribution to a Symposium on Instinct.

initiating and controlling power from the original innate sources. A pioneer and an explorer are more complicated figures; but innate curiosity and an innate *Wanderlust*—well marked in many young truants, and implicit in the love of adventure stories—are the basis of their composition. Pugnacity is another instinct that appears deplorably early in life. Biography may trace its outcome in behaviour until it ends as the mainspring of a soldier of fortune, a prize-fighter, a great footballer, a political party-leader, or even of a not unusual type of philanthropist; but, however much its crude beginning may be transformed or 'sublimated,' the behaviour continues to draw its energy from the same innate tendency. Moving in this circle of ideas S. Alexander finds that science is the offspring of curiosity, the arts and letters of the instinct of construction, morality of the social instinct. It must not, however, be supposed that statements of this kind explain completely any form of human activity. They may point to the most prominent ingredients, but there are always others, often many others, making together a complex tissue of behaviour not easily to be unravelled. Something will be said upon this subject in the next chapter.

An innate determining tendency may be set in motion by a specific bodily state or by an external object or situation of a specific kind. Hunger is an instance of the first class—the class of appetites; curiosity belongs to the second class—the class to which many psychologists would confine the term instinct. The distinction between the classes is perhaps hardly worth much emphasis, for they often overlap. For instance, the sudden intoxication (or revelation) called love at first sight has the authentic mark of an instinct; but it can take possession of a hitherto virginal soul only if there is a certain maturity and disposition of the body, and then awakens what must be admitted to be, or at least to include, a physical appetite. Again, hunger begins as an appetite pure and simple, a determining tendency that can, at most, have through anamnesis (p. 48) a dim prevision of its end before the sucking and swallowing movements it initiates and controls have brought it satisfaction and fully revealed its purpose. It remains an appetite; but its primitive character is obscured in the greedy little boy stuffing himself with apples or tarts; it takes on here rather the

guise of an instinct. He wants to eat because he sees the good things, not because he is hungry.

It is more useful to note that as a child grows older the mechanism controlled by hunger changes from sucking to the co-ordinated activity of jaws, teeth and glands in eating. From the behaviourist standpoint sucking and eating are distinct instincts, but it is more natural to regard them as expressions of a single determining tendency which, at different stages in the child's growth, has at its disposal different means for the pursuit of its ends.

William McDougall, whose views have had great influence ever since he first published them in 1908,¹ distinguished in every instinct two linked though relatively independent parts: (i) an innate cognitive disposition to perceive an external object or situation of a specific kind, and (ii) an innate affective disposition to experience in the presence of this object or situation 'a certain emotional excitement and an impulse to action which finds expression in a specific mode of behaviour in relation to' it.²

In the earliest version of the doctrine the 'certain emotional excitement' had a more important place. The instinct was said to contain three parts, not two: a specific object or situation, acting as a stimulus, awoke in the organism a specific kind of emotion, and the emotion, in turn, energized a specific mode of behaviour. Upon this view the primary emotions were not only linked, each with a particular instinct, but were the central element in those instincts and the source of the energy that issued from them; in A. F. Shand's phrase, the emotions were 'the foundations of character.'

¹ In his *Introduction to Social Psychology* (Methuen). The following quotation (from p. 38) presents clearly McDougall's views of the hormic nature of instinctive activities as well as of the wide range and immense importance he ascribed to them: 'The instinctive impulses determine the end of all activity and supply the driving power by which all mental activities are sustained; and all the complex intellectual apparatus of the most highly developed mind is but a means towards these ends, while pleasure and pain do but serve to guide them in their choice of means . . . these impulses are the mental forces that maintain and shape all the life of individuals and societies.'

McDougall has traced the later development of his views in a memoir, 'Organization of the Affective Life,' published at The Hague in *Acta Psychologica*, II, 3, 1939.

² McDougall, *Outline of Psychology* (Scribners, 1923), p. 110.

It followed that a primary emotion would appear as a core of identity between a human instinct of to-day and its form when man's ancestors were on the same biological level as the higher animals and behaved as they do.

Mother-behaviour illustrates this theory, for, whether in women or in the higher animals, the central factor is the 'tender emotion' which is evoked by the presence of the helpless young and issues in acts of protection and devotion. It follows that in rising from the pre-human to the human level, we must have retained in our endowment the mnemonic basis of this emotion, with its tendency to be awakened by objects of this kind and to flow out in actions of this character. The mnemonic basis has in its evolution lost certain elements which, upon the animal level, restricted the field of mother-behaviour and confined it to a relatively fixed routine; but we must beware here of injustice to our humbler sisters. The not uncommon occurrence of 'happy families' shows that the tenderness of an animal mother is not necessarily limited to the fruit of her own womb; and there are credible stories that prove that her protective actions may sometimes travel far beyond the bounds of a fixed routine. It is plain, however, that parental impulses in mankind are capable of developments enormously wider and richer than animals can ever reach. 'Tender emotion' in women or in men—for women have no monopoly of the gift—may be awakened by the helplessness of children—for example, little factory drudges—whom they have never seen, and may issue in results so far from nature as Acts of Parliament and State administration. The important point is that such developments, however remote, are, to repeat the phrase, historically continuous with primitive parental behaviour, and are intelligible only if we keep in view the tender emotion which runs like a clue through the whole series of phenomena, pre-human and human, individual and social, which connects them with their origin.

Thus mother-behaviour accords well with McDougall's original doctrine; but J. Drever (p. 180), while endorsing his views as a whole, showed that the primacy of the emotions in instinct cannot generally be maintained. Normally, said Drever, the feeling aroused by a stimulus that appeals to an instinct is an 'interest' or feeling of 'worth-whileness,' and emotion comes upon the scene

only if the activity which is the natural outcome of the interest is obstructed. For instance, there is an undeniable association between anger and the powerful instinct called pugnacity; but it is by no means true¹ that pugnacious behaviour must be energized by the emotion. A regrettably large number of people have always deemed that the joy of combat itself makes fighting 'worthwhile,' and have not needed the stimulus of anger to prompt or support their pugnacious propensities.² Observation shows, further, that people differ widely in what Burt has called 'general emotionality,' and that a low grade of emotionality does not always go with a low grade of instinctive energy. A cartoon of *Mr. Punch* (often a shrewd psychologist) once represented a famous Prime Minister as 'boiling over with—indifference!' Yet this statesman's unemotional determination, maintained against bitterest opposition, brought about an epoch-making change in Britain's ancient constitution. In the later version of his theory McDougall goes a long way towards accommodating facts of this order.³

It must be admitted that the position of emotion in the animal economy presents problems not readily to be solved. If the idea that every instinct draws its energy from an emotion is given up, it is difficult not to regard some emotions as independent sources of behaviour. Thus anger and fear are emotions which have definite resemblances to an instinct. Anger is awakened by a specific kind of stimulus—namely, by something that threatens to obstruct the agent's self-assertion, and issues in acts tending to break that obstruction down. In an animal the occasions of anger are easily foreseen, for the impulses to self-assertion are limited in variety; and the acts to which the emotion gives rise are of a relatively fixed and predictable character. It is pretty certain, for instance, that a hungry dog will be angered if another one tries to capture his bone, and that his anger will issue in furious biting. A very young child will behave in an almost equally predictable way if an impru-

¹ As the author, following incautiously McDougall's original scheme, assumed in the former editions of this book.

² One remembers here the anecdote of the Irishman who inquired, 'Is this a private fight, or may anyone join in?'

³ Griselda Grantly, in Trollope's *Framley Parsonage*, is a clever literary portrait of the unemotional type.

dent nurse snatches a treasure from his hands. The occasions of the dog's anger and the acts to which it leads will remain much the same throughout his life. You would not expect the most intelligent dog to be angered by an epigram or to organize a canine conspiracy for his foe's downfall. The child, on the other hand, will grow into a man whose wrath may blaze out at a tale of wrong, or be deeply stirred by an imputation upon the originality of his poems; and may, in the first instance, find relief in an indignant letter to *The Times*, or, in the second instance, be for a time politely hidden, and only revealed in a scandalous portrait of his critic in his next novel.

As anger has thus an occasional rather than an organic connection with pugnacity, so has fear with the instinct of escape. Fear, caused by the imminence of danger, is certainly often followed by 'evasive action' (to use war-time jargon), and so far seems to be part of an instinct. But, on the one hand, it may cause not action but complete temporary paralysis—as when a terrified creature is said to 'sham death,' and, on the other hand, a man in deadly peril may seek and gain safety without having any feeling of fear—though the fear may be felt after the event.

Bacon's aphorism, 'Revenge is a kind of wild justice,' gives a useful hint of the possible relation between the instincts and such emotions as fear and anger. It suggests that they play roughly alternative rôles in life; but that the emotions, having originated in a much more distant past, are for that reason much cruder and more primitive modes of self-assertion. Psychologists with a physiological training (e.g., W. McDougall and C. S. Myers) have long held that, while the definite cognition that appears in instinct has its neural correlates in the cerebral cortex—the most recent outgrowth of the central nervous system—the correlates of the emotions lie rather in the much more ancient region called the thalamic.¹ Of a piece with this view is the discovery by Head and Rivers that the skin contains two sets of nervous elements, subserving what they distinguish as 'protopathic' and 'epicritic' sensibility.² Of

¹ See McDougall in *Acta Psychologica*, II, 3, p. 309, footnote.

² Head permitted Rivers to sever a nerve trunk supplying a large part of an arm and a hand, and kept a minute record of what happened as sensibility slowly returned. C. S. Myers, *An Introduction to Experimental*

these, protopathic sensibility is crude, vague and unmistakably primitive—resembling in these respects the sensations too well known to any sufferer from renal colic or appendicitis or even the ‘stomach-ache’ of childhood. We depend upon the epicritic system for all precise knowledge—for spatial and temporal order, and the quantitative as distinguished from the qualitative aspects of experience; for while the protopathic elements deliver their nervous currents in the thalamus at the base of the brain, the epicritic elements carry theirs upwards to the cerebral cortex. The emotions, it is suggested, are to be regarded as at least in the main reactions of the thalamic or protopathic system, and as retaining much of its primitive character.¹

The view here outlined would explain both the closeness and the variability of the relations between instincts and emotions; for it shows that the response to a situation may sometimes come from an instinct or an emotion acting alone, and sometimes from the two in organized combination. It throws light also upon the general position of the emotions in the organism’s life. W. B. Cannon has shown that violent emotions awakened in moments of crisis may stimulate useful internal secretions—such as the adrenalin that instantly heightens muscular strength and efficiency;² and in these remarkable phenomena we see evidence of the hold the ancient thalamic system has upon the bodily economy—a hold of which the ‘expression’ and other accompaniments of an emotion give further evidence.

No one who has lived through a totalitarian war can need illustrations of the immense influence emotions may have upon the currents of human life; but it is necessary to realize that they sometimes play also a decisive part in ordinary times, and not only in the annals of crime and adventure. For instance, anger as a hot emotion may arise and pass away, but a line of conduct issuing

Psychology (Cambridge Univ. Press, 1911), contains an account of the experiment. It must be added that some doubts have been cast upon the validity of Head’s generalization of his results.

¹ ‘I look upon [an emotion] fundamentally as a *pre-cognitive* response to a “situation”—a *pre-cortical*, thalamic reaction.’ (Dr. C. S. Myers in a letter to the author.)

² W. B. Cannon, *Bodily Changes in Pain, Hunger, Fear and Rage* (Appleton, N.Y., 1918).

from it may persist and develop for years. A tender pity for the helpless was the mainspring of the philanthropic Lord Shaftesbury's life, yet his great work might never have been done but for the burning anger the sight of a specially disgraceful pauper's funeral stirred in him when he was a boy at Harrow. Apart from such decisive moments, emotions constantly heighten the vitality and interest of life, especially of social life. On this ground M. W. Keatinge and other writers claim a high place for æsthetic subjects in the school curriculum. Undoubtedly delight in the beauties of poetry and music, in the best romances and plays and in æsthetic craftsmanship is humanizing in itself, opens vistas into much that is of highest value in human experience, and serves (as Milton says) to 'temper and reduce' the primitive crudeness of feeling 'to just measure.' One can object only to the implication that scope for the culture of feeling need not be provided elsewhere. On the contrary, a serious defect in current teaching of mathematics and science is its relative lack of appeal to the nobler forms of delight.¹

Before leaving the subject of this chapter we must consider briefly its relations to the general theme of the book. One finds in some accounts of the instincts an implication if not an outright statement that they may be regarded as separate items which, when put together, build up a man's self much as a machine is built up of wheels or a wheel of molecules. Any quasi-mechanical theory of this kind must be rejected. We must insist that the organism comes before the instincts and that these are but special modes of self-assertion that have developed and become 'canalised' in the course of its racial history, chiefly on account of their persistent utility to the individual and the race. They doubtless mark out the lines along which both cognitive and motile power have mainly advanced, but the organism, in its creative moments, may use the results of that advance for ends beyond the purview of any of the special instincts. This happens, for instance, in play, where the appetite for life, the

¹ See Keatinge, *Studies in Education*, Ch. IV, and Nunn on Science in Adams' *The New Teaching* (Hodder & Stoughton, 1918). An author in whose ears Mr. Winston Churchill's voice still rings must point out that his superb speeches had so immense an effect because they were highly charged with exalted yet disciplined emotion.

lust for creative self-assertion as such, may employ the whole range of the instincts (p. 38). It happens also in the 'disinterested' activities of science and art. In science man's self-assertion seeks a purely intellectual control over nature (p. 237), and will not rest until he has penetrated her secrets from the stellar system to the electron, has recovered the vanished beginnings of things and can foresee 'what the world will be when the years have died away.' So in the arts and crafts, disinterested self-assertion through skilled movement aims at surrounding life with the 'significant forms' of beauty.

In connection with these generalized aspects of instinct we must note that the life-feeling that colours all our hormic dealings with the world is from time to time intensified into two emotions, also of a generalized character. These are the emotions McDougall speaks of as 'positive self-feeling,' the feeling of exaltation we experience when things go markedly well with us and we are 'superior to the situation,' and the complementary 'negative self-feeling,' or feeling of abasement that comes when self-assertion is baffled or inhibited. Both emotions play an essential part in the economy of mental life. Creative activity is obviously energized by positive self-feeling—'nothing succeeds like success'—and the negative feeling, as we shall see later, is the basis of the mental discipline that sets and keeps self-affirmation upon its chosen courses. But both are capable of harmful and, indeed, pathological exaggeration. Positive self-emotion when exaggerated leads the way to tyranny, to destruction for destruction's sake, and a thousand ills in family, social and political life; negative self-emotion, abnormally developed, plays into its hands, often with deplorable results. And both emotions when dissevered from the constructive or creative movements to which they should minister are apt to find associates in the dark corners of the soul where the vile things called sadism and masochism are bred.

Freud's conception of instinct is not wholly out of accord with McDougall's, though, as T. W. Mitchell has remarked,¹ the instincts he recognizes seem limited to those—distinguished by Drever as 'appetites'—which arise within the organism and seek their objects without. Nevertheless, the Freudian school are highly

¹ *Problems of Psychopathology*, p. 102.

critical of McDougall on the ground of the multiplicity of independent instincts which his scheme assumes. For they hold that human behaviour reduces to the manifold expression of impulses of very few ultimate types ; among which, as is well known, the impulses of the sex instinct (or instincts) fill a very large place.¹

NOTES ON BOOKS, ETC.

W. McDUGALL, *An Introduction to Social Psychology* (Methuen, 9th ed., 1915), is the fountain-head of most of the applications of the idea of instinct in education, sociology, etc., and may justly be called a classic. His views are restated and developed in *Outline of Psychology* (Scribners, 1923), and later in *The Energies of Men* (Methuen, 1933). G. H. THOMSON, *Instinct, Intelligence, Character* (Allen & Unwin, 1924), gives a simple and clear account of 'the way in which man's mind has grown out of the animal mind.' JAMES DREVER, *Instinct in Man* (Cambridge Univ. Press, 1917), is a valuable review of the subject, in the main confirmatory of McDougall's views. An able exposition of a different point of view, substantially that of William James, is given in E. L. THORNDIKE, *Educational Psychology*, Vol. I (Columbia University, 1913).

¹ For McDougall's criticisms of this view, see his *Outline of Abnormal Psychology* (Methuen, 1926).

CHAPTER XIII

The Growth of the Self

Jack, aged seven, visiting for the first time a large town, is taken for a ride in an electric tram-car. He is immensely intrigued by the wonderful doings of the conductor and the driver, and his pertinent but unhappily timed questions cause his mother no little embarrassment. The journey over and tea disposed of, he begins at once to live again through the afternoon's experiences. The drawing-room becomes a tram-car, his mother and complaisant aunts the passengers. He, of course, is conductor, but, in the absence of a play-mate, doubles his part and also serves the motor, Armed with a bag for pouch and a table-gong for bell-punch, he collects fares, issues carefully perforated tickets, stops and restarts the car, and occasionally, in his secondary capacity, rushes to the brake and sounds the alarm to trespassers on the rails. In the full tide of his importance he is carried away, indignant and protesting, to bath and bed.

For two or three days, perhaps, Jack is, in the main, a tram-man. Then there flashes upon his vision the glory of being an airman, piloting his Spitfire across the Channel; or a milkman going his rounds with churns and barrow; or a clergyman conducting a christening; and the one-time tram-man becomes an air-pilot, a milkman, a clergyman, and so on indefinitely.

Let us consider this familiar tale in the light of the preceding chapter. The first thing to note is that it begins with an appeal to a definite instinct—the instinct of curiosity. But the tram-man, the airman and the rest do not come before Jack merely as trivial novelties attracting a moment's attention. They have an impressive quality which, though not so overmastering as to reduce him to impotence and evoke fear, or the high degree of negative self-feeling we have called 'abasement,' is yet pronounced enough to challenge a readjustment of his being to something that cannot be dismissed or ignored. The play that follows is his reply to the challenge. It is the positive phase of behaviour which follows and completes

the preceding negative phase, and is supported by positive self-feeling that may rise, at moments of outstanding achievement, to the level of 'exaltation.'

We must next observe that as long as Jack's self-feeling is set, say, towards tram-conducting, all the other instinctive and emotional tendencies, so far as they are relevant, take their cue from it. The 'collecting instinct' specializes, for the time, in tram-tickets; 'experimentation' ('constructiveness') serves only the business of the hour; anger rises promptly to answer interference with that business, but lets other occasions go; grief clings to failure in it, or fixes its gaze on lost opportunities; desire urges, and hope looks forward to its renewal.

This kind of play might be described as experimental self-building; for it differs from the serious business of self-building only in the relative instability of its results. During the age of making-believe, self-assertion, like a wandering compass-needle, points, now this way, now that, attended in its veerings by the positive and negative self-feelings, and carrying with it the other emotional tendencies, all of which, for the time being, make its objects their own. In a dozen years, Jack, who at seven was everything by turns and nothing long, will have entered, say, upon his promising career as an electrical engineer. He has long been indifferent to the seductions of tram-conducting or the milk-trade, and is content to let others make their fame, unchallenged, in the Royal Air Force or the Church. His self-assertion has taken up permanently the direction of electrical engineering, and is not to be diverted from it except in holiday moments. But beyond the fact that it is committed to a specific line of growth, there is, in principle, no difference between Jack's self at twenty and his experimental selves at seven. The cardinal feature still remains—namely, that the energy of his instinctive and emotional life flows, for the greater part, along the direction given to it by the 'set' of his self-assertion. The impulses rooted in curiosity and the 'experimenting' tendency serve mainly this dominant interest, and become organized into scientific knowledge and technical skill; while those that belong to anger, to envy, and to the other primary and secondary emotions, conspire with them to feed the main current of Jack's development.

It is now clear that the growth of the self may be described as

a process in which the impulses that have their roots in instinct and appetite become organized into a permanent hormic system (p. 38), wielding imperial authority within the organism; or as the building up of a great engram-complex around the instincts and appetites, and the dispositions to knowledge and action which belong to them and derive their energy from them. Like all complexes, the self-complex must be thought of not statically, but dynamically (p. 56). It is the relatively permanent basis of the agent's individuality as this is expressed in a unified system of thought, feeling and action; but it is constantly modified by the results of its own activity (p. 51), and constantly becomes, by consolidation (p. 54), a more coherent, definitely shaped structure, subserving a higher degree of expressiveness (p. 39).

It is this great complex whose growth and activities are brought out by the insight of a good biographer or pictured by the imagination of a great novelist. We cannot attempt to unravel all its complexities, but, adopting the analysis of A. F. Shand, we may profitably note that it is largely built up of certain massive sub-complexes of a typical character whose activities are *sentiments*. The reader will understand the technical meaning Shand gives to this word if he will reconsider Jack the tram-man, and recall how, for a while, all the passions of his being were gathered up into the pursuit of a single object. If that state had proved permanent instead of transient, we might have said that a 'sentiment' for tram-conducting had become established as a constituent of Jack's self. In short, a sentiment is not a single state of feeling, but a *system* of feelings—that is, of emotions, appetites and desires—organized with reference to a particular object, and having a considerable degree of stability.

The pleasant vice of puffing tobacco-smoke affords a simple instance of a sentiment. The basis of smoking is a group of bodily appetites which only psycho-analysis, perhaps, could trace to their origins; but round these low-grade impulses there may grow up an emotional structure capable of raising a sensual habit to the dignity of a social function—even of a ritual in which womanhood once savoured its hardly won freedom! *L'homme moyen sensuel* looks forward eagerly to his smoke, curses the lack of tobacco or matches which robs him of it, seeks to prolong the pleasures of

fruition, takes pride in his expert judgment of brands and pipes, and at times 'knows love's sad satiety,' followed in due course by a blissful return of appetite. All these things are marks of a genuine sentiment. *Mutato nomine*, they may also be said of the normal woman's attitude towards dress—a matter on which discerning philosophers have written with the gravity due to its importance. Here again is a sentiment which, arising from a humble need of the body, draws into its empire a wide range of emotions, and gives exercise to high powers of æsthetic judgment and practical skill. It may sometimes serve unworthy ends, but only a dull or prejudiced critic could belittle the spiritual heights to which it may attain; a generous observer will see how important a part a gifted woman's dress-sentiment may play in developing a gracious individuality, and will thankfully appreciate the value it adds to social life.

These two sentiments are both examples of *love*—the love of smoking and the love of dress. As such they illustrate Shand's weighty point that a love is not a single emotion, but a system embracing a manifold of feelings, which arise, replace one another, disappear and return, in accordance with the varying phases of the agent's relations with the beloved object. In antithesis to the loves we must set the hates. These, too, are sentiments, and—though the fact is at first surprising—involve no emotional element that may not also appear in the loves. To hate smoking, for instance, is, like loving it, to feel pleasure, displeasure, regret, relief, hope, disappointment, and so on; the feelings are the same, only the occasions are different. Love delights in the presence of its object and strives after fuller and richer intercourse with it; hate finds it an offence, and seeks to destroy it, or at least to avoid its presence.

It is an ancient and profound truth that education should teach men to love and to hate the right things; but the aphorism must not lead us into the error of supposing that love and hate are of co-ordinate value. A love, since it urges one to explore and develop the riches of its object, is a principle of growth, of expansion; a hate, since its aim is to destroy relations with its object, is, so far, doomed to sterility. Hate is fruitful only when made to subserve a love, by eliminating hindrances to its growth or purging it of elements that deface its nobility. Thus the 'patriotism' whose core is the hatred of other nations is a poor and fruitless thing, but hatred of

the deeds that stain our country's history is one of the surest safeguards of her honour. Similarly—to compare a smaller thing with a greater—hatred of 'sloppiness' and inexactitude is a necessary element in every type of 'scholarship.'

We conclude that the central duty of school teaching is to encourage loves, and that it should use hates only as the gardener uses his pruning knife to remove the rank growth that wastes the sap of the tree, and spoils its beauty. It follows also that the first step in teaching any subject should be to lay the firm foundations of a love, by so presenting it as to tempt the pupil to a joyous pursuit. If this step be well taken and wisely followed up, there is no need to eliminate the drudgery inseparable from any subject worth serious study. The course of true love never did run smooth, because it never could; for only difficulty, disappointment and hope deferred can evoke the energy that makes a genuine sentiment. On the other hand it must be recognized that no occupation, in or out of school, can win a pupil's love unless it appeals to a sufficiently strong instinctive propensity, or can retain his interest if repeated small successes do not outbalance the discouragement of occasional failure. McDougall has shown attractively¹ how this principle works in acquiring a 'taste,' say for a game or a sport; it applies equally to the acquirement of more serious interests. It is quite necessary if, as an unconventional headmaster has urged,² every pupil should be expected to find in some school study or occupation a '*grande passion*' that he can embrace with a will and pursue with boldness and some originality.

Much of the doctrine set forth above is summarized in the following quotation,³ 'Once above the purely physiological or reflex level, co-ordinated human activity [as in a sentiment] is always the expression of some grouping of the fundamental energies brought about and sustained by (or rather in) an idea. . . . But note that when we speak of an idea as an instrument of the self's expansion we mean an idea-in-action, not an idea as an object of intellectual appre-

¹ In *Acta Psychologica*, II, 3, p. 338.

² K. Hahn, *Education for Leisure* (1938).

³ From T. P. Nunn, 'Freedom and Discipline,' in *Report of Conf. on New Ideals in Education*, 1915. Cf. A. N. Whitehead's warning against 'inert ideas' in *The Aims of Education* (1929), Ch. I.

hension. . . . An idea as such has no power to influence conduct. It has power only when and in so far as it becomes a vehicle of the energies that are the *prima materia* of the self. This is the truth which the greatest teachers of mankind have always known and used. It is also the rock upon which most "systems" of education have eventually foundered.'

From this digression let us return to Jack, and seek to fill up some of the gaps in his psychological history.

About the inner life of a baby nothing can be directly known; ¹ we can only observe and interpret his behaviour much as we observe and interpret the behaviour of animals. There is, however, no doubt that in the earliest months one of the strongest constituents of the self is established—the sentiment or group of allied sentiments that grows up around the primitive bodily appetites and the pleasures and pains of the physiological functions. According to the psychoanalysts the early history of these sentiments has profound significance for later years; for it does much to determine whether the child will be yielding or obstinate in temper, whether he will become an 'extravert' finding his business in outward things, or an 'introvert' concerned mainly with his own feelings and thoughts. And ages before Freud it was recognized that the sentiments connected with bodily satisfactions have the greatest importance for character, whether they develop into the self-indulgence of the voluptuary or the asceticism of the saint.

In the terminology of Freud,² the infant's early mental state is one of 'narcissism' (p. 160). He exists solely for himself, or rather nothing exists for him except himself, and the world's process is only the tale of his bodily gratifications and distresses. But out of the vague, all-inclusive unity objects gradually emerge—objects which define themselves as mother and father—and with their

¹ But the psychoanalysts claim to be able, by the analysis of dreams, and the interpretation of their symbolism, to reconstruct its main features. Susan Isaacs, *The Nursery Years* (Routledge's Sixpenny 'Introductions,' 1929), is an excellent non-technical account of infancy by a writer fully versed in the newer psychology.

² Freud's later account of these matters is given in his difficult book, *Das Ich und das Es* (1923), translated as *The Ego and the Id* (Hogarth Press, 1927).

appearance love and hate, the oldest of all forces, begin with this new soul their ancient game. In short, there arises a situation which, if Freud is to be believed, deserves far more than any situation in adult life to be called 'the eternal triangle.' Here the child must fight one of the decisive struggles of his moral life; for out of it is to come not only his 'ego'—the self with its outline marked clearly in consciousness—but also, born of identification (p. 160), with one or both parents, his 'ego-ideal'; that is, the ideal image of what he may be and ought to be as contrasted with what he is. In the language of Shand and McDougall, he begins to build up in his mind a mother-sentiment, a father-sentiment and a self-regarding sentiment, and in the last named to lay the first foundations of will and conscience. However much we may discount Freud's theory of the 'Œdipus-complex,'¹ there is no question that Jack will acquire from his relations with his parents—and, to a smaller degree, with his brothers and sisters—engram-complexes that will powerfully influence, for good or evil, his subsequent conduct and happiness. Thus, though it may be too absolute to say that Jack, when he goes a-marrying, will be unconsciously seeking his mother again, yet it is safe to predict that his behaviour in the new relation will be greatly affected, positively or negatively, by the character of the first intimate intercourse of his life. For, as Shand pointed out, and as we have already suggested, every strong sentiment generates its own peculiar qualities which tend to reappear in analogous sentiments. Similarly, the qualities developed in Jack's sentiments towards the family cat and dog may be expected to colour his behaviour towards human beings over whom he has the same despotic power, or, if they do not appear in the same form, will probably be expressed symbolically or show other signs that they are working in the darkness of 'the unconscious' (pp. 55-63). Similarly again, Jack will discover in the development of his sentiments towards his school studies the ideal of patient and thorough work to which he will owe so much of his success as an electrical engineer.

Jack's parents, we shall suppose, are sensible people; but where parents lack wisdom or the opportunity to use it, defects in early

¹ The evidence against it collected by Valentine, p. 337 *et seq.*, is very impressive

family relations may easily lead to weakness or distortions of a child's character which will hamper him throughout his life. The 'spoilt child' is a case whose plainer features it needs no psycho-analysis to diagnose, but there are subtler results of faulty up-bringing which may cause great misery and mischief and be serious hindrances to effectiveness in later years. There is the child whose persistent naughtiness at school is due not to original sin, but to starved affection seeking notice, perhaps even the noxious luxury of physical punishment, as a substitute for a mother's tenderness. There may arise the jealousy and perpetual, unreasoning resentment which drive children like Nellie Malone (p. 61) upon their evil courses. There are the unhealthy 'fixations' upon mother or father or some parent-substitute (for instance, a too forceful friend or a teacher) which make it difficult for the victim to form natural attachments at the proper age or even in extreme cases to show a 'will of his own.' In fact, for the person directly concerned, the business of growing up is not always either simple or safe. Accordingly parents and teachers, who have so great a responsibility in connection with it, will do well to study its difficulties and its dangers, recognizing that the first duty we owe to the young we love is to help them to establish themselves firmly upon their own feet, and that the worst wrong we can do them is to make them mere appanages of ourselves.¹

To an occasional observer, Jack's progress from the cradle to the verge of manhood will seem to fall into well-marked stages: there are babyhood, earlier and later infancy, childhood, boyhood, and adolescence, each with plainly marked characters of body and mind. Psychologists have sometimes held that these phases succeed one another in waves of growth separated by pauses; but a closer scrutiny of the facts seems to discredit this view.² It is now seen that the line of growth has no regular and universal undulations, but, on the whole, trends steadily upwards. It is true that it may

¹ J. A. Flügel, *The Psycho-analytic Study of the Family* (International Psycho-analytic Press, 1921), deals with these matters very fully from the Freudian standpoint. Abundant and illuminating concrete instances are given by Burt in *The Young Delinquent*.

² See C. Burt's article, 'The Education of the Young Adolescent,' in *Brit. Journ. of Educ. Psych.* for Nov. 1943.

show now and then a steeper ascent or a 'plateau,' indicative of a sudden speeding up or a slowing down of change; but these incidents occur in different children at different ages, and seem to be due to individual conditions, external or internal. Nevertheless such irregularities may sometimes reveal an interesting turn, or even a crisis, in a child's development. W. Stern's record¹ of his child's linguistic progress offers a good illustration of this point. At fifteen months the child had 15 words at her disposal, and during the next few months seemed to gain very few more, though her parents noted at nineteen months their impression that her 'speech reservoir' was silently filling up and must some day suddenly overflow. This expectation was fulfilled; for during the twenty-fifth month she made use of more than 50 words for the first time. Carl Stumpf, another German professor, quoted by Valentine, records with an obvious mixture of pride and astonishment that his son, aged three years and three months, suddenly began one day to speak good German 'as though the Holy Ghost had descended upon him.' Similar phenomena may occur at any age and in connection with any practical interest or branch of learning, and are, as Stern rightly insists, of much importance from the standpoint of teaching-methods; the most mature mind needs its 'incubation-periods' during which to consolidate past achievements and to prepare for a fresh advance.

During the first five years home might have given the little Jack all he needed—a mother's care, a father's protection and friendship, with freedom to find his own pleasures and to use his elders shamelessly as means to them. But his parents have the modern outlook, and when their child was two years old decided to entrust him for several hours each day to the well-equipped and well-conducted nursery school not far away. Here children profit by a healthier regime and a broader range of educative occupations than any but a few could enjoy at home. They acquire regular hygienic habits, including an hour's sleep after the midday meal; they learn to associate with other children, not only in indoor and outdoor play, but also in daily duties connected with the seemly provision of meals, in decorating the school premises and in other social services.

¹ 'Tatsachen und Ursachen der seelischen Entwicklung' in *Ztschft. f. ang. Psych.*, 1907.

The three R's are rightly excluded from the nursery school, but speech, more basically important than any of these, receives constant informal cultivation; and there are opportunities for games and play with toys—now alone, now with others—giving scope for fantasy and invention and for running, dancing and climbing and other exercises of the physical powers. From such things children gain much more than formal lessons could give them at this stage. Nor need there be a gulf between the school and the child's home. The best schools aim at a firm alliance between the two powers, and encourage visits in which parents may confer with the wise directress of the school about their children's development and needs.

When five years old an English child comes within the purview of the education laws. At this age Jack was transferred to the infants' school or department—the portal through which, at age seven, he entered the primary school proper (or junior school) where he is to spend the years of childhood (7 to 11 *plus*).¹ He has now a nimble tongue and can express himself clearly and correctly on all topics within his range; he has mastered the mechanics of reading and writing and even begun to read simple books privately for his own enjoyment; and he has been initiated into the mysteries of number. Thus he has learnt to handle in a simple way instruments that are fundamental to future learning. But in an atmosphere where Froebel and Montessori are dominant influences and their ideas are intelligently expanded and applied, his interests and powers have been developed in many more attractive directions—for instance, in music and in arts that cultivate simple constructive skill. In conduct, too, he has travelled far from the dependence on others that marks the nursery years, and is learning to stand upon his own feet.

And now, in the primary school, he assumes, at first timidly but ere long with conscious pride, the status and dignity of a schoolboy.

¹ Jack's parents are fortunate people. The neighbouring primary school is housed in attractive and hygienic premises with excellent provision for physical exercises and outdoor play; it is intelligently directed, has well-trained teachers genuinely interested in their task; and is able to maintain among its pupils a standard of cleanliness, behaviour and speech that prevents Jack's rather particular parents from feeling that in entrusting him to it they risk the soundness of their child's health, manners or morals, or imperil their own respectability. *O si sic omnes!*

Home has lost its all-importance and shrinks to a base of operations where Jack reposes and refits between dazzling experiences with joyous comrades in a greater world—one that includes, besides his school, the pack of 'Wolf Cubs' in which he is enrolled. An intelligent and docile child, he makes excellent use of all the school provides for the nurture of mind and character during childhood—a period that has its own needs and its own values distinct from the needs and values of infancy and adolescence, though developed out of the former and looking forward to the latter. In conformity with that idea the aim of the school, we are told, 'should be to develop in a child the fundamental human powers and to awaken him to the fundamental interests of civilized life, so far as these powers and interests lie within the compass of childhood, to encourage him to attain gradually that control and orderly management of his energies, impulses and emotions, which is the essence of moral and intellectual discipline, to help him to discover the idea of duty and to ensue it, and to open out his imagination and his sympathies in such a way that he may be prepared to understand and to follow in later years the highest examples of excellence in life and conduct.'¹

We must agree that if the school can do these things for Jack it will serve him well.

In a series of striking studies² Professor Jean Piaget of Geneva has sought by well-devised and cautious questions to elicit the views which Jack and his fellows entertain during this period—so far as those views are not provided for them by their elders. His results are a somewhat surprising revelation; for they show that children's mentality retains, in the heart of a civilized and scientific world, features strongly characteristic of the mentality of primitive peoples. A child is slow in finding the distinction between thought and things which becomes later so wide and so obvious. He supposes that

¹ Quoted from the official *Report on the Primary School* (H.M. Stationery Office, 1939), p. 92. D. E. M. Gardner, *Testing Results in the Infant School* (Methuen, 1942), includes a fair and illuminating comparison between the methods of the older type of infant school and the type in which the methods follow more closely the 'free' methods of the nursery school.

² See the bibliography on p. 203.

one thinks with the head, the mouth, the ears. He confuses the properties of things and their names, so that (for instance) he thinks he knows that the sun is called 'sun' just as he knows that it is bright—because he sees it. He shares with the primitive a belief in the reality of the images seen in dreams. He shares also that attitude of the savage towards non-living things which anthropologists call 'animism.' He has the crude idea that everything in the world has been made artificially as tables and windows are made. And he retains, as the savage does, so much of his primitive 'narcissism' as to believe in a kind of intimate unity of himself with the rest of the world and of everything in the world with everything else. That belief is the basis of magic, and most young children seem to be magicians.¹

It is at first hard to understand how such vagaries can co-exist with the common-sense, practical realism, and genuine scientific curiosity which children also display. The answer to the puzzle is that no one's mind is a homogeneous structure, but, like an ancient building, has co-existent parts of widely differing dates and styles. In other words, there are many levels of mentality, and it is fairly easy for a mind to pass from one level to another.² Thus a business man with 'no nonsense' in him may drop from the modern level to that of the painted savage when he mounts a mascot upon his car or (in a transatlantic tea-shop) listens more than half seriously to the prophecies of the professional tea-cup reader engaged by the management. Conversely, a savage may believe wholeheartedly in the powers of his witch doctor and yet be quite competent to deal with a faulty motor-engine. Jack's mind will, as a whole, move rapidly towards the modern level because he is immersed, at home

¹ E. Gosse, *Father and Son*, Ch. II, records his search for a magic formula or gesture which would have power to make the birds and butterflies figured in his father's books fly out of the page. Mention of this by the author to a small class of young men elicited at once two equally striking confessions. One student remembered that, when a child, he believed that he could, by turning a certain button on his coat, make the sun hide behind clouds or disclose itself; another that he could not bear the destruction or loss of his old clothes because he felt that they must contain something of his own life.

² See the criticisms of Piaget by Susan Isaacs in *Mind*, Vol. XXXVIII, N.S., No. 152.

and in school, in the traditions of modern civilization. The education of the African tribesman must be slow because the tradition which constantly presses upon him, being itself primitive, favours the primitive elements in his outlook.

The broadest difference between the earlier phase of childhood and the one Jack has now reached may be expressed in Freudian terms by saying that the former is ruled by the 'pleasure-pain principle,' the latter by the 'reality principle.' We have noted this difference in play (p. 92), seeing how the infant's activities first develop in a fantasy-world which answers instantly to his desires, and only later become disciplined to the conditions of reality. It would, however, be an error to regard the pleasure-pain principle and the reality principle as connoting radically different types of impulse. The transition from one to the other consists in the gradual permeation of relatively blind instinctive impulses by intellectual elements, in conformity with McDougall's general law. At the same time, the conflict between the principles of which Freud speaks is a real and important thing. The boy of twelve is, in the main, a realist who has learnt to comport himself in his world (especially in his social world) as its nature requires; but he is liable to lapses in which the complexes underlying his normal behaviour lose their coherence, and his impulses seek, as in infancy, short cuts to satisfaction. Hence the sudden fits of 'temper,' of selfishness, and of other forms of naughtiness into which the best of boys or girls may fall.

But this general difference is associated with one more specific—the definite emergence of the herd-instinct¹ or 'gregariousness'

¹ It has been indicated (p. 160) that in Freud's view the so-called herd-instinct is not an independent group of impulses but a development from those family relations which constitute the common foundation of moral institutions both in the single mind and in the community. With reference to W. A. Trotter's book, *The Instinct of the Herd in Peace and War* (1916), he suggests (*Massenpsychologie und Ich-analyse*, p. 98) that man began not as a 'herd-animal' but as a 'horde-animal,' the horde being, as we have said, a family writ large. The present author feels that Freud's arguments have much force and that a great deal is to be gained by viewing the wider social relations of boys and girls at school as extensions of the narrower relations of the home. Since, however, these wider relations become in

as the main root of social conduct. Like all instincts, gregariousness develops from the level of simple, unorganized impulse to that of highly intellectualized behaviour. The boy of ten is a gregarious but hardly a socialized animal; he still regards the world as his oyster, but demands the help and countenance of others in opening it. Thus he is essentially a member of a hunting pack in which he is either a leader or one of the led.¹ He rarely attains to the higher levels of social conduct until he is swept up to them on the last great wave of his development—adolescence.

The growth of the instinct illustrates very clearly McDougall's general theory. It is a mistake to think of it as an innate tendency towards social behaviour in the eulogistic sense of the word 'social'; it consists, at first, in impulses, morally colourless, which simply urge a child to find his life in active relations with others. The course of those relations is settled rather by the subsequent history of the instinct than by its original character. Thus there are people, in whom the instinct is strong, who are miserable when they are alone because they have then no one to quarrel with! But it is evident that if a child is to live in constant intercourse with others, he must make his ways square with theirs; he must make their *mores* his own. Hence the morality which the child first adds to the simple ethic of family life is the law of his pack: the club-law, which remains, with the majority, the most powerful influence on conduct throughout their days. With the advent of adolescence what was in the main an uncritical acceptance of the ways and standards of the herd may, however, deepen into an explicit 'social

time largely independent of home relations and may even conflict with them, there is a convenience in retaining the nomenclature and treatment which McDougall has made familiar.

¹ It will be observed that McDougall's positive and negative self-instincts, when associated with the herd-instinct, take specific forms which Graham Wallas termed 'the instincts of Giving and Taking the Lead' (*The Great Society*, p. 142).

In the view of some writers—*e.g.*, Carveth Read (p. 46)—the herd-instinct arose historically when our prehuman ancestors, who were probably non-social, were compelled to turn from vegetarianism to flesh food, and were driven to hunting in packs like wolves. The reader will note the psychological insight which led Lord Baden-Powell to institute the 'Wolf Pack' for boys too young to sustain the dignity and fulfil the law of the Scout.

consciousness' of a truly ethical or religious character. The adolescent often cherishes, with generous heat, ideals of social service and sacrifice for others; he may set himself deliberately to increase the happiness or to raise the ethical level of his society; and may even be driven, if it proves to be hopelessly out of harmony with his new-found ideals, to repudiate its claims upon him, and to transfer his allegiance to some company of elect souls, the noble living or the noble dead.

Social life, created and sustained by the gregarious instinct, is thus the primary school of morals in which all men are formed. Speaking generally, the principles of conduct learnt there are those that tend to subserve the stability and well-being of the common life; but since societies have grown up under the most varied conditions and have widely different histories, there have been and still are great divergences between their actual moral codes.¹ Even within the limits of a single social group there may be differences of life so marked and so constant as to generate widely diverse conceptions of virtue and vice. According to the American sociologist, Thorstein Veblen,² the social structure of the modern Western nations still retains, in transmuted form, a moral bifurcation of this kind, established in the barbarian stage of their cultural development. Barbarian man reserved to himself all functions connected with government, warfare, hunting, religious observances and sports; and he relegated all base, mechanical functions to his women. With the growth of slavery this division of functions ceased to have the simplicity of a sex-distinction, but it persists in modern societies as the difference between the leisured, non-productive classes and the 'lower orders' who labour with their hands. And Veblen goes on to show how the primitive severance of functions produced two very different schemes of moral values, in part complementary but in part sharply opposed.

In an age that foresees the virtual disappearance of the non-productive classes, other evidence that moral standards vary with the social structure might be more apposite. The perverted ethic of Nazi Germany offers evidence too startling to be overlooked and

¹ The facts collected in such works as Westermarck's *Origin and Development of Moral Ideas* show impressively how great the divergences are.

² *The Theory of the Leisure Class* (Macmillan, 1905).

too plain to be misunderstood. Its tragic significance cannot be ignored, but it only brings out in glaring colours facts which our own society shows clearly enough in quieter shades. Old and precious standards are still firmly maintained among us in the Civil Service, in the great civil and military professions, and elsewhere; but there are widespread social regions where revolutions in industrial organization and transport, and the all-permeating influence of such inventions as radio-telephony have brought changes in the people's ways of life and thought that are not merely superficial but amount to a partial reshaping of their moral outlook.

A teacher who holds that his pupils' character should be his chief care may find these facts a little bewildering. The moral code expressed in men's deeds is, he learns, a function of the concrete social order in which they live and act. But he has also to observe that this order has changed greatly in the course of history, and is, in fact, changing rapidly at the present day. What then becomes of the sanctity of the moral law? Is it more than a useful convention whose form depends on circumstances of time and place? And if so, is it honest to treat it as if it had inspired validity? The answer surely is that in the world of conduct as well as in the worlds of knowledge and art the human movement has sometimes gone backwards instead of forwards, and has often gone astray. Yet in all three worlds its most enlightened guides have led it to positions so dominant and so stable that, once occupied, they can never be long abandoned. Thus duty will for ever be duty—the 'stern daughter of the voice of God' when it conflicts with some selfish impulse, a kindly, if austere, guide and friend when felt to be the natural fulfilment of a natural obligation.¹ To love one's neighbour as oneself will for ever be the highest social imperative, and 'hardness of heart and contempt for divine law and commandment' the great danger from which societies as well as individuals will for ever need to be delivered. These are among the fruits of insight and wisdom whose permanent validity and supreme worth can hardly be doubted, though they may, in varying circumstances, prove their value in varying ways.

¹ Cf. H. Bergson, *The Two Sources of Morality and Religion* (Eng. trans. 1935), pp. 10-12; also the citations from Bridges' poem, *The Testament of Beauty*, on p. 244 of this book.

This conclusion accepted, we may note certain educational corollaries of the principle that the moral code actually expressed in men's deeds, in distinction (often a painful distinction) from the code they profess, is a function of the concrete social order wherein they live and act. That principle not only explains the existence of the unsatisfactory thing once called 'schoolboy morality,' but shows also that no moral instruction could have changed it unless the form of the school society had itself changed. If 'schoolboy morality' has almost disappeared it is because that form *has* changed, and schools are now rarely governed with the autocratic and sometimes savage authority that evoked perpetual underground revolt.

The theory that the social life of a school may so be planned from above as to produce a particular type of citizen rests on the same principle. The training of a 'ruling class' in the older public schools of England or, in the 'progressive' schools, of a type whose social inclinations are to be towards co-operation rather than competition equally illustrate it. The principle also shows, conversely, that moral instruction is of little use unless it is based on the actual social experience of boys and girls, and helps them to solve the problems of conduct their experience presents. Thus, it reinforces the principle that the school should give its pupils scope to work out their own education freely under the guidance of sound traditions. Lastly, it reminds the teacher that the moral tradition he himself follows and tends to propagate is almost certainly coloured by some specific type of social experience and history. It challenges him, therefore, to ascertain its sources, and so assure himself that it represents not the narrow outlook of a single class, or even of a single people, but something universally human (p. 244).

The social instinct, we have said, begins its finer work as adolescence approaches. Adolescence is a subject of deep and perennial interest which has been abundantly 'documented' both by the older psychological science and by the art of the novelist; but in a masterly paper¹ Ernest Jones has shown that the new psychology has valuable fresh light to throw upon it. His main point is that

¹ 'Some Problems of Adolescence' (*Brit. Journ. of Psych.*, July, 1922). The reader will not fail to see how strongly Jones's argument supports the policy of making a 'clean cut' across education between the ages of eleven and twelve.

our emotional history from the age of about twelve to full manhood or womanhood parallels with remarkable fidelity the broad features of the previous development from birth to the age of twelve. Just as the earlier period is punctuated by the passage from infancy into childhood, so the later one is marked by the transition from the 'storm and stress' of adolescence to the relative calm of the adult state. Thus, in spite of great superficial differences, there is a deep congruity between adolescence and infancy. The problems the child met and solved before the age of five meet him again on a higher plane between the ages of twelve and eighteen. There is, for instance, the problem of self-control, which sums up so much of the duty and difficulty of youth. It is by no means fanciful to see here a repetition of the infant's task of securing that control of bodily functions which is the first condition for membership of any decent human society. There is the problem of escaping from the prison of self-love to the freedom of altruistic interest in one's fellow-beings, and from self-centred fantasy into acceptance of the world as it is; and the problem—which the psycho-analysts deem the fundamental one—of subduing and spiritualizing the sensual impulses. These, too, face the adolescent as they faced the infant, but in more complex and developed forms; and upon his good fortune or happy inspiration in dealing with them, consciously or by unconscious repression, depend in large measure the qualities of the character with which he will finally emerge into manhood.

Jack, whose ability and intellectual interests carried him easily from his primary school into the County grammar school, has, we may suppose, now reached this great climacteric, this new birth of body and mind. The premonitory symptoms have been evident for the last year or two: rapid increase in height, a loss of the rounded features of childhood, a deterioration in the treble voice that did such good service in the school choir. It has been remarked, too, that his zeal for study had diminished, that he had deserted his old hobbies, that he had become a little moody and intractable—in short, that he seemed to have lost his bearings. But though, at sixteen, he is no longer the same Jack, he is rapidly shaping into a new one. He displays a startling solicitude about his appearance, is exacting on the question of collars, resents imputations on his manners, and is conscious, evidently in a bewildering new

way, of the existence of the other sex. As regards work, he has pulled himself together in time to pass his matriculation examination creditably, and is now studying science and mathematics with great vigour, and with a clear awareness that he is laying the foundations of his professional career. Indeed, if he were not at least equally zealous for the honour of his school in sports, and serious about his duties as a prefect, he might degenerate into that deplorable character, a 'swot'! His inner mind is not nearly so accessible as of old, but those who are privileged to glimpse into it find great changes there. Jack has stumbled into the discovery of two infinities—the infinite in nature and the infinite in his own soul. The childish fancy that once played capriciously with the outer world is replaced by the imagination that seeks its deeper meaning. He is just now reading Keats and Darwin with hot enthusiasm and a vague feeling that they belong together. He will gladly talk about them with his intimates, but about his other discovery he is silent. It is believed, however, that he took his confirmation seriously, and suspected that he has a copy of Thomas à Kempis concealed in his bedroom.

These things are clear evidence that new sentiments are springing up in Jack's nature, and that some of the earlier ones are changing their objects and becoming greatly widened and deepened. These will, no doubt, exhibit many qualities carried over from his childish sentiments; but repressions and sublimation have been active during the period of change, and much of the older material has been worked up into forms novel enough to give a fresh turn to the lad's character.

Among the expanded structures we must take special note of what McDougall calls the self-regarding sentiment. In early life our sentiments are almost as 'objective' as the animals'. A greedy little boy aims at the largest share of the chocolates as simply as a greedy dog aims at getting the largest share of the bones; a little girl in a pretty new frock indulges her positive self-feeling almost as naively as a peacock exhibiting his tail. Even in adult life such objectivity remains possible; a man may often be so much absorbed in the immediate object of his activity as to forget everything else. But in quite early days man, as distinguished from other animals, begins first to recognize, then to appreciate himself as an actor in

his life's drama. 'Self-consciousness' probably arises from the infant's discovery of the distinction between his body and all other things, a distinction made possible by the pleasures and pains that are found to be connected with the body. In time it spreads from this centre to his clothes and his toys, to his family and friends; in later years to the house he owns, to his motor-car, to the business he has built up, and so on indefinitely. For his dealings with these things give rise not only to sentiments directed immediately towards them, but also to a secondary 'self-regarding' sentiment directed towards them as inseparably connected with his feeling and acting self. In short, these things become, so to speak, the capital with which he consciously faces the world; and that capital, as it prospers or dwindles, is the object of joy or sorrow, hope or fear, and of the other systematized feelings that may enter into a sentiment. Meanwhile he learns, through relations with others, to focus his attention upon himself as an agent and upon the character of his acts. Through the praise and blame, the rewards and punishments of parents and teachers, through the frank verdicts and merciless practical criticism of his school-fellows, through the more restrained but yet more terrible force of 'club opinion' in adult life, he comes to entertain towards himself as an agent emotions and desires that enter into and become the strongest part of the self-regarding sentiment.

A healthy adolescent has usually reached in this way a fairly coherent conception of his self as an 'ideal object,' including some vision of what he actually is and some prevision of what he may and should become. It may be merely the idea of a self that keeps strictly within the limits of 'good form,' or of one inspired by teaching, observation and reading to stretch out towards original lines of achievement and lofty ends. And when it is formed, the self-regarding sentiment, whose object it is, plays in all the affairs of his life, especially in its crises, the dominant and most widely controlling part.¹

It will be seen that the function of the self-regarding sentiment is to exercise control over the 'objective' sentiments that form the ground-basis of the self. Suppose a money-loving man to have

¹ McDougall's and Freud's theories of the 'ideal self' seem to be complementary rather than contradictory (pp. 160-1).

the opportunity of making great gain by safe but questionable means. A habit of honesty, acquired like a dog's, may keep him straight, but if this is not strong enough, there may still be, in the self-regarding sentiment, a reserve force sufficient to restrain the impulses that belong to the sentiment for gain. The man turns his mental gaze back from the immediate object of the sentiment and views himself as the agent in this dirty business. His self-contemplation is coloured by the shame and remorse he had suffered through backsliding in the past, and by anticipation of possible shame and remorse to come; and the thought of himself as the doer of this act is, we may suppose, rejected in a moment of aversion that wells up out of the self-regarding sentiment.

This trite example may suffice to show how the self-regarding sentiment becomes the vehicle of 'conscience' and of the moral will that waits on it, and also to indicate the essential part played by the social instinct in the generation of conscience. But the sentiment serves another controlling function of high importance. If, like William James, 'I, who for the time have staked my all on being a psychologist, am mortified if others know much more psychology than I; but I am contented to wallow in the grossest ignorance of Greek,' it is because my self-regarding sentiment has firmly attached itself to myself-as-a-psychologist as its 'ideal object.' In brief, the sentiment acts like a gyroscopic wheel, keeping my self-assertion true to its main direction of expression (see p. 182).

We must, however, be careful not to take too simple a view of this function. The ground-basis of the self is, as we have seen, a very complicated thing, prompting to developments in many directions, some of which would prove, in the end, quite incompatible. A man, gifted by nature and smiled on by fortune, may approximate to the Greek ideal, and build up a self into which the love of the body, of family and friends, of riches, of intellectual and spiritual things makes a unified and nicely balanced whole; but even a man of 'strong character' generally has to make drastic sacrifices among his possibilities, while a man of weak character wobbles and drifts and reaches no stable self at all.¹ The average

¹ A quotation from James's famous chapter (*Principles of Psychology*, Ch. X), is inevitable here: 'Not that I would not, if I could, be both handsome and fat and well dressed, and a great athlete, and make a million a

man compromises; he tries to run several more or less distinct selves, among which there must generally be, in James's phrase, a certain conflict and rivalry. Thus Jack at the age of forty will not be merely an enterprising electrical engineer. He will be also, we may imagine, a devoted family man, keen upon backing his wife's social pretensions, and on securing his children's future; an esteemed churchwarden, who stands well with the vicar and is not indifferent to his reputation for serious views and good works; and, perhaps, a golfer sternly bent on reducing his handicap. And he will be singularly fortunate if his organism can carry these diverse selves without occasional distraction and conflict.

Even in normal cases, then, the self-regarding sentiment does not exercise perfectly its function of control over the development and organization of the primary sentiments; to a certain extent it is liable, so to speak, to be divided against itself. In pathological cases a group of sentiments may get so entirely out of hand that the division in the self-regarding sentiment becomes complete, and to say that the organism harbours more than one self is then a statement of plain fact. These are the cases of 'multiple personality,' of which one of the best studied¹ is the celebrated case of 'Miss Beauchamp,' the University student whose organism, as the result of some moral shock, produced a vigorous secondary personality calling herself 'Sally'—a personality with all the liveliness and caprice of a naughty child, who from time to time displaced the prim Miss Beauchamp from command of her sense-organs and powers of movement, and horrified that innocent young woman

year; be a wit, a *bon vivant*, and a lady-killer, as well as a philosopher; a philanthropist, statesman, warrior, and African explorer, as well as a tone-poet and saint. But the thing is simply impossible. The millionaire's work would run counter to the saint's; the *bon vivant* and the philanthropist would trip each other up; the philosopher and the lady-killer could not well keep house in the same tenement of clay. Such different characters make any one of them actual, the rest must more or less be suppressed.'

¹ By Morton Prince (*The Dissociation of a Personality*, Longmans, 1906). Other famous cases are described in James's *Principles*. B. Hart, *The Psychology of Insanity*, Ch. IV (see above, p. 67), gives a very clear analysis of the phenomena of dissociation—which are, as the reader will see, closely connected with the facts of relaxation described on pp. 84–5.

by the scandalous levity of the conduct for which she was made to appear responsible.

We need expect no such catastrophes in the life of Jack, whose purely fictitious career has been used as the occasion for our psychological comments; but their existence and nature strongly confirm the view of the self, as a gradually developed organization, which we have attempted to make clear.

NOTES ON BOOKS, ETC.

A. F. SHAND's theory of sentiments is expounded and used in McDougall's *Social Psychology*. J. M. BALDWIN, *Social and Ethical Interpretations* (Macmillan, 1899), illustrates fully the inter-play of positive and negative moments described on p. 181. J. W. SLAUGHTER, *The Adolescent* (George Allen, 1912), and OLIVE WHEELER, *Youth* (Univ. of London Press, 1929), are excellent little books for those who cannot face STANLEY HALL's monumental *Adolescence* (Appleton, 2 vols., 1904). EDUARD SPRANGER, *Psychologie des Jugendalters* (Leipzig, Quelle und Meyer, 5th ed., 1929), is an eloquent and weighty work, with a wide continental reputation and influence. The first chapter of L. T. HOBHOUSE, *Morals in Evolution* (Chapman & Hall, 2nd ed., 1908), gives an excellent analysis of the rôle of the social instinct in moral growth. JEAN PIAGET's books have been translated under the titles, *Language and Thought of the Child* (1926), *Judgment and Reasoning of the Child* (1928), *The Child's Conception of the World* (1929). All are published by Kegan Paul. There is also *La Causalité physique chez l'enfant* (Paris, 1927). J. DREVER and M. DRUMMOND, *The Psychology of the Pre-School Child* (Partridge, 1929), illuminates clearly the life of infancy. SUSAN ISAACS, *Intellectual Growth in Young Children* (Routledge, 1930), is the first volume of an important scientific study of childhood based upon careful original records.

In the foregoing chapter it has been judged convenient to sketch the normal development of a child in favourable circumstances. C. BURT, *The Young Delinquent* (Univ. of London Press, 1925), is a masterly study, richly documented, of the troubles which beset boys and girls whose heredity and environment are adverse.

CHAPTER XIV

The Mechanism of Knowledge and Action

In the preceding chapter we traced the growth of the self mainly in terms of instinct and feeling, for the reason that these are in a special sense the 'foundations of character.' But, with the discussion of Chapter XII in mind, the reader will readily see that there can be no organization of feelings into sentiments, of sentiments into a self, apart from a parallel development in the objects to which feeling responds and in the actions that issue from it. Thus the simple emotion of fear may be awakened, say, by the explosion of a bomb, but the sentiment of hatred that grows out of it has a much more remote and complex object, such as war, while the self as a whole responds to still more abstract objects, such as duty; and the actions that flow from the emotion, from the sentiment, from the self, show a corresponding increase in complexity.

The task now before us is to study in more detail the factors concerned in cognition (or knowledge) and action. For education, it is of the highest importance to realize that cognition and action always occur in an organic unity from which neither can be separated without destruction of the other. In the simpler activities the connection between them is easily brought out, even when it is not immediately obvious. It is clear, for instance, that one cannot 'take in' the form of an object or the contents of a picture without constant adjustments of head and eyes, including delicate movements of the focusing muscles. Again, if the reader will open his mouth, hold his lips widely apart, and think how such words as 'prism,' 'parallelogram' sound, he will probably be aware of an almost irresistible tendency to move lips and tongue, and find that he cannot pronounce the words 'mentally' unless at least he deliberately recalls how the movements of those organs would 'feel.' Conversely, if he will scribble a few sentences, attending meanwhile to what goes on in his mind, he will probably notice that the act of writing is accompanied by 'inner speech'—that is, by the silent repetition of the words in his own voice or another's; and he may,

especially where he is uncertain of the spelling, have before his 'mental eye' a fleeting vision of how the words look in print or script.¹

In the higher types of intellectual activity the connection between cognition and action becomes so subtle that it needs careful analysis to bring it to light; but it can always be detected if the inquiry is pushed deep enough. For example, the mastery of a geometrical theorem would seem a purely intellectual performance; yet when the learner is bidden to 'suppose the triangle ABC to be superimposed upon the triangle DEF,' it becomes clear that action, after all, is not really excluded. The reasoner does not actually perform the action, but it is evident that the argument carries conviction only because in his childhood he has done innumerable things of the same kind as he now supposes to be done, and is familiar with the results.

As a second instance, take one of Burt's reasoning tests—the one set for age ten. 'There are four roads here: I have come from the south and want to go to Melton. The road to the right leads somewhere else: straight ahead it leads only to a farm. In which direction is Melton?' Now the reader may reach the answer 'west' in more than one way. He may put himself in imagination in the position of one coming from the south, may decline the

¹ The silent repetition of the sound of speech or (*e.g.*) of a melody is called an *auditory image*, the 'mental picture' of an absent object a *visual image*. People differ widely in regard to their power of calling up images and the use they make of them. Some, especially scientific men, who get into the habit of thinking solely in terms of words and mathematical symbols, appear to have no visual imagery. It is, however, probable that all normal children have both visual and auditory images, and that the differences that are found in older persons are due to habit and practice. The imagination of 'how it feels' to make a movement—*e.g.*, to lift the arm while it remains at one's side, or to stand up while one remains sitting—is called a *kinæsthetic image*. This type of image is referred to in the preceding sentence of the text.

Many children and a few adults possess 'eidetic imagery'—*i.e.*, visual images so bright and so substantial that they seem to present actual objects rather than memory-pictures. Eidetic imagery probably explains such psychological oddities as the practice of the portrait painter who required his subject to give him only one sitting, and thereafter worked from the image he had retained.

eastern (right) road because it 'leads somewhere else' and the northern road because it goes only to a farm, and may thus find that only the western road is left to take; or he may use an imagined diagram instead of imagined movements; or he may, from the remembered list of the four directions, delete south, east and north in that order and find that only west is left. But whatever method he uses he will discover that the cogency of his argument rests upon the long familiar results of *actions* which he has carried out on numberless occasions and now represents to himself with more or less concrete fullness.

Facts of this kind justify Bradley in saying that to reason is to 'perform an ideal experiment'; we do so-and-so in imagination and note what consequences would follow. Nor is thought free from the trammels of action even when it soars into the heights of metaphysics—

Where never creeps a cloud, or moves a wind, . . .
Nor sound of human sorrow mounts to mar
Their sacred everlasting calm.

For such thought rises on the wings of words, and even the most abstract of words, like mental images, may ultimately refer to physical actions. For instance, the statement that twelve *minus* five is seven, though scarcely metaphysics, is certainly abstract—too abstract, indeed, to be grasped by a very young or a very stupid intellect. To such it becomes intelligible only when one counts out a concrete collection of twelve things (*e.g.*, twelve coins), removes, one by one, five of them, and counts the seven coins that remain. The expert who can simply say 'twelve *minus* five is seven' and say it with complete conviction did not reach his proud position immediately; he had to begin where the child and the dullard now are. His statement is, in fact, merely a short-circuited representation of the actions we have described and is intelligible because it is so. We repeat that truly metaphysical statements, though they may be farther removed from the foundation of direct physical activity, are yet similarly connected with it and owe their significance to the fact that they ultimately rest on it.¹

¹ Behaviourist psychologists (pp. 29–30) go further than we have here gone, and point out that the utterance of words is itself physical activity of the speech organs—visible activity when we speak aloud, minute invisible

We have here the basis of the well-worn maxim, *Learn by Doing*; which means that understanding and action are so intimately related by nature that they cannot be sundered without loss—loss that does not fall least heavily on the side of understanding. This, for example, is what Sir J. J. Thomson meant when he observed that Senior Wranglers, on taking a course of practical work in his laboratory, were astonished to find that their formulæ were true! A mathematical truth may be but a tenuous thing, even for a Senior Wrangler, until it gains body by incorporation in action. That is why it is hardly possible to overestimate the value of practical work in teaching such subjects as mathematics, geography and science, especially in the earlier stages. Even where practical work is not feasible, a theoretical argument should generally be presented in a setting of imagined experience, rather than in a purely logical exposition.¹ The judicious use of the dramatic method in teaching history is parallel with the direct form of practical work; while to discuss the application of historical and political principles to present-day problems is to follow the indirect practical method which is generally more appropriate in teaching older pupils.² And we have recently insisted on the importance of basing moral training on

activity of the same organs when we 'speak to ourselves.' Upon this view the essence of the foregoing argument is that we acquire habits of speech-activity which are substitutes for, and symbols of, the original activities which they are said to 'mean.' Thus 'twelve minus five is seven,' when spoken, read or 'thought' is a train of subtle activity of the speech organs which replaces and so represents the gross limb-activities involved in manipulating collections of things like coins.

¹ The reader will find in John Perry's writings, in J. Strachan's article in *The New Teaching*, or in the present author's *Teaching of Algebra* (Longmans, 1914), numerous applications of this principle in mathematics.

² In one well-known public school the history master used to take his senior boys to some characteristic industrial district to study political and industrial problems *in situ*: in another, local trade union leaders, etc., are invited to visit the school debating society from time to time. There is a danger that such methods may be turned to propagandist purposes that have no proper place in a school, but, if judiciously used, they succeed, as nothing else can, in giving a solid basis to historico-political studies. In *Actuality in School* (Methuen, 1938), G. J. Cons and Catherine Fletcher give a lively account of attempts to 'awaken the live consciousness' of primary school-children by getting a postman, a dustman and a fireman to give 'talks' in the classroom, and by visits to factories and workshops.

vivid and natural social experience (p. 197). All this fits in, as it ought to do, with what we have learnt about the didactic value of the play-motive.

The old psychology taught that all higher knowledge grows out of the immediate cognitive contact¹ with the outer world which we gain through the senses. Modern psychology, as we have just seen, insists that the basis is really wider than this; that it includes not only sensation, but also the muscular movements which sensations provoke through feeling. The famous statue which Condillac imagined to become endowed with the human senses, one after the other, would never have gained human intelligence as long as it remained a statue, and so unable to reply by movement to the challenges of the outer world. The physician-teacher Séguin was the first to grasp clearly the pedagogical significance of this truth. He noticed that weak-minded children are often incapable of the simplest organized movements; they cannot grasp and roll a ball like normal children, or follow its path easily by co-ordinated movements of head and eye. With penetrating insight he connected their feebleness of intellect with this deficiency, and sought to ameliorate the former by curing the latter. His method, as is well known, was adapted by Montessori to be a cardinal feature of the training she prescribes for normal children. In a Montessori school the little people of three and four spend much time in inserting buttons into button-holes, in threading and tying laces, in fitting cylinders and geometrical insets into the holes that match them; and it is claimed that in this way they lay the best possible foundation for higher intellectual achievements.²

The 'sensori-motor reactions' which contain, according to this

¹ We must distinguish between the immediate cognitive contact we have with a thing when we see, hear, touch, smell or taste it, and the indirect cognitive contact we have when we remember or think of it in its absence, using images or words, or when we learn about it through the spoken or written speech of another. There is a parallel distinction between direct and indirect action—for instance, I may go and fetch a thing myself, or move another's muscles to do so by speech or writing.

² Margaret McMillan, in her touching little book, *The Camp School* (Allen & Unwin, 1917), maintains that much of the dullness and backwardness of children in a slum district, such as Deptford, is due to lack of training

doctrine, the promise and potency of all human achievement, call for closer examination. Let us consider a typical case. I approach a puppy, lying passively on his side, and stimulate his skin by patting him lightly behind the shoulder. After two or three taps, his hind leg begins to show a rhythmic vibration which soon grows into a vigorous scratching movement. When I cease patting, this movement continues for a moment and then dies away. To understand what has happened here we must look with the eyes of the anatomist and the physiologist below the dog's skin. Beneath numerous spots ('pressure spots') in the *area* patted, fine white threads arise which can be traced back to the spinal cord that lies within the backbone. On the way thither, they come together to form bundles (the 'nerves'), in which they lie side by side, insulated from one another like the wires in an electric cable. Just before a bundle runs into the cord through a 'posterior root,' making its way between two 'vertebræ' of the spine, each thread connects sideways with a minute bulb of nervous matter forming part of a swelling or 'ganglion' of the posterior root. Beyond these bulbous masses the threads enter into the cord, and break up into fine branches that are distributed largely round the similar bulbs that teem there.

Each thread with its bulb constitutes a 'neurone' or anatomical unit of the nervous system. The bulb is the 'nerve-cell' or 'cell-body,' the centre of the neurone's life and activity.¹ The thread, from the pressure-spot to the cell-body, is the 'axon' or nerve-fibre of the neurone; beyond that point it is the 'dendron,' breaking up into fine 'dendrites.' Since the function of the neurones we have just now in view is to carry the nervous stimulation from the skin to the spinal-cord, they are called 'sensory,' 'afferent,' or

of the basal senses—that is, not only of the eye and ear, but of smell, the temperature sense and the 'mother sense' of touch. Only one in twelve of her children could, when blindfolded, tell one strong-scented flower from another. Some would be content to live in a bath of perspiration, always over-clothed; some to remain in the open with blue lips and chattering teeth. 'The patience of the poor [she says] is not all patience. It is largely insensibility.' To such children a shower-bath, with its powerful appeal to dull senses and flaccid muscles, may mean a veritable beginning of intellectual and moral enlightenment.

¹ A nervous thread or axon dies if cut off from the cell-body. This fact is largely utilized in tracing the course of a neurone.

'receptor' neurones, and the ends of the axons, where the 'nervous current' was set up by the tapping, are called 'receptor organs,' or simply 'receptors.'

The nervous current conveyed through a receptor neurone passes, by way of its dendron and dendrites, into one or more 'connector neurones' that lie entirely within the spinal cord. To reach them it must cross the separating surfaces or 'synapses' that were believed by their first investigators to break the anatomical continuity of the nervous path and to be the seat of a varying resistance. Within the cord it may pass from one connector neurone to another, across the synapses, along a vast variety of paths. To awaken clear consciousness, it must make its way upward to that expansion of the cord which we call the brain, and ultimately to the convoluted cortex or 'rind' of grey nervous matter which forms the surface of the 'cerebral hemisphere.' To produce movement, it must issue from the cord along neurones of a third type, called 'efferent,' 'motor,' or 'effector'; and, if the movement is to be 'willed' and not merely reflex, must start from the cortex. Thus we reach the idea of the cortex as the grand instrument of organization and control; the means by which we win, on the sensory side, our vision and understanding of an orderly objective world spread out in space and time, and, on the motor side, the power of endlessly adjustable behaviour and creative skill. The cell-bodies of these neurones lie *within* the cord, and their axons, leaving the cord by its 'anterior roots,' take their way towards the periphery in the same nerve-bundles as convey the afferent neurones towards the cord. Along them the nervous current is distributed to the muscles, and there sets up the contractions that cause the movement.

It will be seen that every motor neurone may be a 'final common path' for currents that reach it by endless different tracks along the connector-neurones of the brain and cord; hence the possibility of the infinite variety of 'voluntary' movements that may occur under the control of the brain. But to complete our picture we must note that most anterior roots of the cord also contain connector-axons which make their way to effector neurones entirely outside the cord. Since these neurones are reached each by a current that arrives, ultimately, along a single line, the effects they excite are not subject to modification by the will. They constitute, therefore,

an 'involuntary' or 'autonomic' system. Organized into three main groups (separated by the nerve-trunks from arms and legs), together with a smaller group in the head, their function is to control the flow of the blood, the digestive movements of the intestines, and the excretory organs, and to bring about the automatic adjustments of the eyes. In addition, there seem to be effector-neurones, associated with each main group of the autonomic system, which control the secretion of the sweat-glands in the skin, the digestive glands, etc.

To return to the scratching puppy. When the nervous currents set up by the patting reach the cord, they must find tracks of low resistance already prepared, along which to flow through the connector-neurones to the effector-neurones of the leg; for it is otherwise impossible to see why the stimulation is followed by scratching rather than by any other movement of body or limbs. Physiologists use the term 'reflex system' to describe this innate connection between a group of receptor and a group of effector-neurones. In some reflexes—for example, the 'knee-jerk,' or the blinking reflex that is released when an object suddenly approaches the eye—the mechanism is relatively simple; in others it is exceedingly complicated. For instance, the puppy's scratch-reflex must contain arrangements to secure not merely simple movements, but rhythmic contractions of the 'antagonistic' muscles that cause backward and forward movements of the leg.

But though a current takes more readily paths innately prepared, it is by no means confined to them. Let the reader lay his arm, with palm upwards, on a table, and proceed to lift, at intervals of a second or less, a weight suspended from a finger by a string. He will find that the movement, at first confined to the relevant finger, will spread to the other fingers, then to the muscles of the lower and finally to the whole arm and shoulder. In this experiment, due to McDougall, we must suppose that fatigue gradually lowered the conductive facility of the original reflex path, and that the current then began to overflow into neighbouring paths, spreading ever wider as the resistance of these paths also rose.¹ The gradual

¹ McDougall, 'Fatigue' (*Report of British Association*, 1908). McDougall explains in the same way the progress of intoxication from the liveliness produced by the first glass to the toper's final collapse beneath the table.

consolidation of a movement learnt by trial and error (p. 155) shows the opposite process; the resistances along the relevant paths become so much reduced, by successful practice, that we have finally what psychologists aptly term a 'secondary reflex.' It should, however, be noted that there is now a tendency among neurologists to attach less importance than formerly to the synapses and their functions. It seems not certain whether they mark anatomical breaks in the nervous tracks; and if they do, it is impossible to conceive how their resistance is incessantly adjusted as thoughts flit through the mind and the body is called upon to respond by constantly varied movements. Even where, as in primary reflexes, the nervous impulses follow well-marked paths, injury to the path does not always imply permanent loss of the reflex; the impulses often, after a while, take new paths which serve as well as the old. In face of these facts MacCurdy (p. 219) suggests that the essential thing about a reflex is not that the nervous impulses traverse a definite set of neurones, but that there is a definite *pattern* of impulses which may be conveyed by any suitably located set of neurones—much as a tune is a pattern of musical tones which may be realized equally well in any part of the gamut. See p. 43.

The first movements of all animals with a nervous system are reflexes, and reflexes form the basis of all the skilled movements they can acquire. Strictly speaking, for instance, a bird does not *learn* to peck, and can fly, without previous training, as soon as its wings and the correlated nervous mechanism have developed to the proper point. Similarly, an infant is born in vigorous possession of the sucking reflex, and discloses others as his nervous system ripens. At first he is contented to lie supine, but a moment comes when nothing can prevent him from sitting up. Later, he will propel himself rapidly across a floor by means of his arms, though he has never seen his parents use that undignified mode of progression. Later still, he stands erect and walks—generally, it is true, with the officious assistance of admiring elders, but really in virtue of his walking-reflex. Subsequent achievements are made possible by the synthesis of the primary reflexes into larger systems.

The way in which this synthesis is brought about has been described earlier (p. 155), and has, as regards certain forms of skilled performance, been made the subject of careful experiments. Of these

the experiments of W. F. Book on typewriting are particularly instructive.¹ Book recorded graphically the rate of work of each learner and found that the curves showed typical waves (*cf.* pp. 188-9), corresponding to definite stages in the synthesis of the reflexes. The first stage is the learning of correct letter-habits—that is, of secondary reflexes which, at the moment the typing of a letter is willed, carry the right finger automatically to the right key. As these habits are acquired, the rate quickens, and the graphic record climbs upward. Soon, however, there comes a ‘plateau’ showing a temporary arrest in the increase of speed, followed shortly by another rise. The interpretation is that the original letter-habits are being gathered up into syllable and word habits, in which the series of movements needed to type a syllable or a word are released by a single impulse. While these wider reflex-systems are forming, the partial withdrawal of attention from the individual letters causes errors and delay. It is, however, noteworthy that the letter-habits themselves become perfected only through the formation of the higher habits. Later, there may be a plateau corresponding to the emergence of phrase-habits; but it is naturally less definite and may be absent. During the whole process, imagery of several kinds plays an important part; though, as skill increases, it tends to drop out and to leave the impulse to write a word or phrase to be followed directly by the required movements. It is probably for that reason that the best results are obtained by learners who adopt the ‘touch method’ from the beginning, instead of the ‘sight method’ in which the fingers are guided to the keys by the eye. It is *possible*, further, that we have here a justification of Montessori’s practice of teaching children the forms of letters kinæsthetically instead of visually, by making them run their fingers round sand-papered letters and draw the shapes blindfolded.

The general bearing of these results on teaching hand-writing has been questioned but seems fairly clear. Some teachers would begin with the word as the smallest unit that has meaning,² but we

¹ *The Psychology of Skill* (University of Montana Publications in Psychology, 1908).

² By general agreement *reading* should begin with the word, though some teachers, pushing a sound principle to an extreme length, would begin with sentences and phrases.

see that if legible and beautiful writing is to be learnt, the child should first establish the habits of lowest order. There is no reason why a 'play-way,' such as Montessori's, or more ancient nursery ways, should not be used to give isolated letters sufficient meaning. Book's results warn us, however, (i) that the child should be allowed to advance spontaneously from single letters to words, and (ii) that these should be words that he can already read with ease. On the whole, a 'phonic' method, in which the child learns to construct words to match their sounds, by putting movable letters together, and afterwards writes them, seems to be indicated as the ideal. But in the case of a language cursed, as English is, with irregular spelling, concessions must be made to the 'word' method.

Such a method implies teaching reading and writing in close association and with letters of the same form. Learning to read involves, in fact, building up *recognition*-habits of increasing complexity. The increasingly complex writing-habits should follow *after* the recognition-habits, serving to make the latter sure and precise, and at the same time developing into a sister-art with functions of its own. If one stands behind an expert reader, holding a small mirror near his eye, it is easy to observe that the eye does not move continuously along the line, but covers the space in from three to five jerks separated by momentary rests. It is during the rests that the recognition takes place, a logically connected word-group being 'taken in' at each momentary glance.¹ Thus the normal object of an expert's recognition-habit is a phrase. To this position children must be led through lower recognition-habits, due place being given to the law that a lower habit is perfected only as one passes on to the next higher, and the necessary concessions being made to the irrationality of English spelling.²

¹ See Huey, *The Psychology and Pedagogy of Reading*, for accounts of more precise experiments.

² It should be unnecessary to point out that reading should at all stages be *meaningful*, but this elementary principle is often neglected where children are taught in large classes. One comes across children who can 'read almost anything,' but are yet quite unaware that the printed words convey meaning. The remedy is, once more, the 'play-way.' The child should be given 'secret' instructions in writing which he is to read and carry out, etc. Even older pupils, who receive little but oral teaching, often have surprising difficulty in gaining information from books. The habit, which

Cognition, as we have said, begins in the senses. In addition to the anciently recognized 'five gateways of knowledge,' we must take account (i) of the temperature and pain-senses whose receptors are in the skin ; (ii) of the senses whose receptors are in the digestive and other inner organs, where their stimulation causes hunger and thirst, the well-being of health and the distress of illness, together with other vague sensations that are closely connected with our sense of personal identity ; (iii) of the kinæsthetic sense, by which we are kept aware of the position and movements of the head, trunk and limbs. The kinæsthetic sense has, in addition to receptors in the joints, tendons and muscles, a highly important group in the labyrinth—a curious organ, deeply concealed within the ear. This group is concerned not only in movements of head and eyes, but also in the initiation of a continuous series of reflexes which keep the body normally in a vertical position, and maintain the 'tone' of the leg and trunk muscles by whose constant activity is made possible the wonderful but little regarded feat of keeping upright. Thus the giddiness of a waltzer is due to unusual stimulation of the labyrinthine receptors,¹ while the muscular collapse of a boxer 'knocked out' by a blow on the point of the jaw is explained by the shock to the labyrinth which puts the attitude-reflexes out of action.

The researches of physiologists and the clinical experience of surgeons suggested long ago that the brain's functions are all located in definite parts of its substance—for instance, that there are in the cortex 'centres' for understanding and uttering speech, for the control of the several limbs, etc. Medical text-books in use at the beginning of the century often contained maps of the brain's surface intended to teach the young surgeon this important geography. But later observations, such as Sir Henry Head's studies of the effects of gun-shot wounds and K. S. Lashley's sensational experiments on rats (see p. 219), have shown that the older strict localization went much too far, and that a function whose ordinary home

is, of course, the essential thing in reading, should be deliberately trained from the beginning. It is carefully to be distinguished from reading aloud, which should be treated as an æsthetic art akin to music and drama.

¹ The odd behaviour of the 'waltzing rat' appears to be due to an hereditary peculiarity in the labyrinthine structure.

in the cortex has been suppressed by injury can often find in time another one elsewhere. In a word, we have here another instance of the organism's creative autonomy, *i.e.*, its power to control and within limits to modify its own structure for the development or maintenance of its essential functions.¹

Much of what we have now learnt about the nervous system may be summed up in Sir C. S. Sherrington's dictum that it is an integrating mechanism, and that the cerebral cortex is the supreme integrating organ. But this statement must be supplemented by the equally important remark that the nervous system is also an *analysing* mechanism, and that its highest analytic functions are performed by means of the cortex. An animal with no nervous system or with only a simple one can have at best but a rudimentary awareness of the world and of itself. To gain more it must be able to pick out and distinguish the different elements and qualities of which the world is composed. That feat is made possible for higher animals by the enormous development of the receptor-system, with its organs differentiated to deal, some with light, some with sound, and so on. Similarly, a high development of action is possible only where there is a motor system which enables an animal to achieve a great variety of distinct movements. Thus the function of the nervous system is never purely integrative nor purely analytic, but always *analytico-synthetic*. And this twofold nature of its activity appears equally in cognition and in action.

We must presently study it in cognition in some detail; but before we do so it will be convenient to offer some remarks on a specially important type of behaviour in which the integrative function appears at its highest. We speak of *will*. In the popular view, will is a distinct power, possessed by different people in different degrees, which is brought on the scene to carry out one's actions or to break down resistance to them. The mistake here is in thinking that will is a *special* power separate from the energy expressed in one's other activities. The power by which I make and ensue a momentous decision is the same as the power by which I pick up a pin or tie my shoe-lace while conversing; what is different is the organization that lies behind the acts. According

¹ See the reference to MacCurdy on p. 43.

to McDougall, will always involves the activity of the self-regarding sentiment (pp. 199-200), in which case we must, apparently, deny it to all animals but man ; but whether we do or do not accept such a limitation, we must agree that an act, to be properly called an act of will, must draw its energy not from a small part of our nature, but from some massive, deep-rooted, widely inclusive engram-complex.¹ Thus if picking up a pin expresses merely a habit of tidiness, it is not an act of will ; but if my right to pick it up is challenged, or if the pin is in a dangerous or inaccessible position, my self-regarding sentiment may be brought into play, and the act will then be unquestionably an act of will.

From this account it should be clear that there can be no 'training of the will' apart from the general process by which the sentiments are built up. Hence, Montessori is right in maintaining that to train a child's will we must begin by leaving him free to work out his own impulses. For if he is constantly checked or constantly acts only on the directions of another, there can be no building up of strong sentiments to be the basis of effective and well-regulated conduct. His earlier sentiments will be choked with inhibitions preventing natural action, and, in conformity with Shand's law (p. 187), will tend to pass their unsatisfactory quality on to all later sentiments. Thus we shall produce in the end a man who has never learnt to act from a wide and firmly organized inner basis ; a man who will at one time face a critical situation in hopeless indecision, at another will break out in childish and inconsequent action.

The popular view has, nevertheless, a certain basis in fact. People differ immensely in native energy, and this difference comes out most markedly in the highly organized behaviour of will. Moreover, there are important differences in the way in which, in different persons, feeling is awakened by cognition and passes into action. From this point of view James distinguished between the 'explosive' type of will in which an idea captures feeling and instantly issues into action, and the 'obstructed' type, in which action is delayed by inhibitions. N. Ach has carried the analysis a good deal further, bringing it into relation with the doctrine of 'temperaments.' To

¹ The apothecary's cry in *Romeo and Juliet* (V, i), 'My poverty, and not my will, consents,' exemplifies this point.

the four temperaments or 'humours' anciently distinguished as the sanguine, the choleric, the phlegmatic and the melancholic, he adds a fifth, the 'cautious' (*besonnen*). The cautious, sanguine and choleric temperaments have in common a high sensitiveness to outward events and influences, together with a strong motor tendency; while the phlegmatic and melancholic temperaments are alike in lacking these qualities. Comparing them from the standpoint of will, we find that in both the cautious and the phlegmatic temperaments the determining tendencies that set and maintain the direction taken by the action are not only very strong at the outset but also preserve their force with little diminution throughout its course. The sensitiveness and alertness of the cautious person make him welcome action, and give him a certain mobility and adaptiveness during its progress; the phlegmatic person, on the other hand, is slow to move, but when moved, 'sets his teeth' and ploughs his way imperturbably to the end. The sanguine person, sensitive and lively like the cautious, embraces opportunities of action with equal readiness and sets out with the same strong determining tendencies. But the strength of the tendency soon falls away, so that he often fails to carry the matter through. Nevertheless his optimism makes him rapidly forget failure, and he is ready to embark on the next enterprise with the same easy confidence. In distinction from these three types, neither the choleric nor the melancholic temperament is capable of strong determining tendencies. The choleric person, however, cannot 'keep out of things,' and though often checked by failure due to lack of concentrated effort, is by his sensitiveness spurred on to fresh exertions, and so generally 'muddles through somehow.' The melancholic person shares the weakness of the choleric without his compensating liveliness of sense and movement. Thus he is both ineffective and apathetic, capable neither of a strong original effort nor of being sufficiently stung by failure to achieve success in the end.

Some psycho-analysts hold that, like the difference between the 'introvert' and the 'extravert' to which they partially correspond (p. 186), these differences are set up in infancy.¹ On the other hand, they may be, as is more generally believed, factors in original endowment. In either case they are, by the school age, characters

¹ See E. Jones, *Papers on Psycho-Analysis*, 2nd ed., Ch. XI.

which are alterable with difficulty, if at all, and, when present in a marked degree, must be taken into account in the management of children.

NOTES ON BOOKS, ETC.

C. S. SHERRINGTON, *The Integrative Action of the Nervous System* (Scribners, 1906), is the standard work on reflex action. W. H. GASKELL, *The Involuntary Nervous System* (Longmans, 1916), gives a clear and authoritative account of the autonomic system. J. T. MACCURDY, *Common Principles in Psychology and Physiology* (Cambridge Univ. Press, 1928), elaborates in detail a thesis entirely congruent with the position adopted in this book. K. S. LASHLEY, 'Basic Neural Mechanisms in Behaviour' (*Psychological Review*, January 1930), is a still more drastic (indeed a revolutionary) criticism of the ordinary mechanistic ideas. N. ACH's scheme of temperaments is quoted from his interesting lecture *Ueber den Willen* (Leipzig, Quelle and Meyer, 1910). For Séguin, see H. HOLMAN, *Séguin and the Physiological Methods of Education* (Pitman, 1914). E. RIGNANO, *The Psychology of Reasoning* (Eng. trans., Kegan Paul, 1923), traces the connection between reasoning and lower activities.

CHAPTER XV

The Development of Intellect

It is hardly possible to date or to describe the beginnings of a child's mental life. At birth the world must be for him, James said, 'one great, blooming, buzzing confusion'; but a healthy baby seems to be little troubled by this fact, even if he notices it. His appetites and bodily needs and his dawning instincts determine the points at which he attacks this 'confusion' and begins the long task of clearing it up, while his reflexes, gradually increasing in definiteness and coherence, are, so to speak, the tools he uses. Passing by the earliest days, let us suppose a child old enough to 'take notice,' and let that notice, motivated by curiosity, fasten, say, upon a bright silver spoon. We all know what will happen; how watching, stretching, grasping, carrying reflexes will be set in motion until, after some 'trial and error,' the spoon is conveyed to the child's mouth. The reader will not fail to note that the analytic and synthetic powers of which we spoke in the last chapter are brought into play from the first moment of this incident. For, in the first place, the infant picks out the brightness of the spoon from its less attractive surroundings, and, in the second place, the mere perception of it as an object outside himself, more or less definitely shaped and placed, implies, as we saw, a considerable piece of organizing work. But let us proceed.

Next day the spoon comes again within his ken. He perceives it with obvious pleasure, and carries it once more to his mouth with a dexterity much increased by yesterday's successful effort. His behaviour leaves no doubt that his cognitive 'attitude' towards the spoon is not what it was at first; but in what respects is it different? All that we can safely assert is that, as the child now contemplates the spoon, its appearance is 'complicated' or coloured by references to yesterday's experience, so that while the same it is yet not the same. The perceived shape and brightness, the cool feeling when the metal was grasped, the stretching, gripping and carrying, the triumph that attended the success of those operations, and lastly

the delight of pressing a cold, hard body between the gums : all these items were, by the infant's analytico-synthetic activity, singled out and integrated into a unitary experience with a definite and coherent form ; and when the spoon is again seen, the seeing takes place through the activity of the engram-complex in which that form was registered. In accordance with the general law (p. 63), much, perhaps most, of the activity of the complex remains below the level of clear consciousness ; but it does not fail to produce definite effects above that level. Thus the 'sense of familiarity' the babe enjoys at the second sight of the spoon may be referred to the fact that, having dealt with the object successfully before, he feels ready to react again ; in other words, it probably consists (i) in incipient tendencies, vaguely apprehended, to repeat the former movements, (ii) in a revival of the feeling of successful self-assertion that attended them, and, in addition, (iii) in some revival of the pleasure experienced when the spoon lay in his mouth. These elements fuse with the appearance of the spoon and give it its new character ; in the usual language of psychologists, they give it its *meaning*.

Some time later his mother records proudly that baby has shown keen interest in a large wooden spoon lying on the kitchen table, and seemed to prove by his behaviour that he classed the novel object with the familiar silver one. This feat implies a much higher exercise of analytico-synthetic power. For it implies (i) that the numerous shapes presented by the silver spoon, when held in different positions, have been registered as a distinct subordinate organization within the 'spoon-complex,' (ii) that the similarly varying shapes of the wooden spoon can also awaken the activity of this organization, although there is no other resemblance between the two objects, and (iii) that the activity thus awakened carries with it enough activity of the spoon-complex as a whole to secure *some* degree of recognition. The qualification 'some' is important ; for the child's cognitive attitude towards the wooden spoon cannot be precisely foreseen. It may correspond to the thought 'I have seen something like this before,' or to 'This, I feel sure, is a spoon, though I do not know why,' or to 'This must be a spoon, for though very different from the silver spoon, it has the same shape.'¹

¹ The infant cannot, of course, think these thoughts ; but the different cognitive attitudes possible have to one another the same relations as these

We may summarize what we have just said by the statement that the child is able to *abstract* the shape from the other qualities of the spoon, though he need not, in a given case, be aware that he has done so. The part here ascribed to abstraction in the perception and recognition of objects has been illuminated by some interesting experiments of T. V. Moore.¹ Moore exhibited to his subjects a series of rows of fanciful figures, each row, after a very brief exposure, being replaced by another. All the figures were different, with the exception that one of them occurred in varying positions in every row. The subject was to indicate when he recognized clearly that the same figure had occurred more than once, and was then to give an account of his states of mind during the experiment. The results showed that the perception of the common figure passed through several stages. There came first a mere awareness that *some* sort of figure had been repeated; then a more or less vague apprehension of its shape as (for instance) circular or pointed; thirdly, a correct idea of the shape, but with doubt or error as to the orientation; lastly, a true knowledge of its position as well as of its shape.

Moore concluded that in visual perception the material before the sense is organized under 'mental categories,' of which some may be of the utmost generality and vagueness, others more specific and precise. We may speak of them as 'concepts,' or, following H. Sturt (p. 246), as 'patterns' or 'schemas'; but whatever name we give them, we must think of them not as passive, but as active things, which direct and govern apprehension just as determining tendencies direct and govern action. Indeed, it is evident that there can be no determining tendency which does not include in itself a pattern or schema of the action to which it prompts. And it will be noted that a schema, like a determining tendency, is the

thoughts have. Valentine (p. 420) notes that his child (aged 1; 7), having learnt to call sparrows 'dickies,' afterwards applied the word also to other birds and then to flies, spiders and bits of floating fluff. At about the same age, the author's child, confronting the sea for the first time, hailed it excitedly as 'ba'' (bath). These infantile essays in generalization are rather more subtle than the one given in the text.

¹ *The Process of Abstraction* (University of California Publications in Psychology, Vol. I, No. 2, 1910).

activity of a complex which does much of its work in the unconscious.¹

Most of the active concepts or patterns with which our minds are filled have been derived by abstraction from experience, but some must be regarded as innate. For example, there is in all human beings a tendency to build their perceptual experience into an outer world of separate 'things,' moving and acting upon one another in space and time. Here the categories are of the widest generality. On the other hand, instincts² in animals and sometimes in man may contain schemas of a more detailed character, as in the case of the bird that builds its nest according to the ancestral pattern. The number and nature of racial concepts lying between these limits is not easily determined. C. G. Jung points to the curious uniformities in the myths of primitive peoples, and holds that these express 'archetypes' or racial categories 'which coerce intuition and apprehension to forms specially human.'³ His view may be pressed too far, but it is clear that our power of seeing and understanding the world around us depends upon a power to read 'patterns' into it, and it seems equally clear that some of these must be archetypal in Jung's sense, though they multiply greatly in the course of experience. Thus a doctor can diagnose a new

¹ The 'meanings' of words are schemas or patterns of this kind, and to learn (as a child does) the use of a word, such as 'dog' or 'jumping,' is to discover what schema or pattern is in the mind of other persons who already use it, to make that schema one's own, and to associate it firmly with the word. The process was analysed experimentally by F. Aveling and described in his book, *The Consciousness of the Universal* (Macmillan, 1912). Aveling presented his subjects with sets of kindred pictures, an artificial or 'nonsense' word being invented to describe each set. Thus the set showing little boys running, jumping, etc., was labelled 'ferod,' the set showing a variety of receptacles for liquids was named 'tegam,' and so on. The experiment consisted in studying the steps by which the schemas became abstracted from the groups of things represented and attached to the words as their meaning.

² We have seen (p. 171) that instincts may be thought of as innate determining tendencies.

³ Jung, 'Instinct and the Unconscious' (*Brit. Journ. of Psych.*, Vol. X, No. 1, 1919). The ways of regarding the world, which we have noted (p. 191) as common to untutored children and primitive peoples, are possibly to be explained thus.

case of illness, an engineer can see how a new machine works, a policeman can smooth out a difficult tangle in the traffic, because their experience has provided them with categories, concepts, or schemas by means of which they can 'take hold of' the situation before them. This power, indeed, often works by means of which the expert can himself give but an inadequate account;¹ for it consists mainly in the activity of complexes below the conscious level.

In considering perception it is natural to give a large place to the facts of vision; but what we have said applies throughout the whole realm of the senses. It is evident, for instance, that to hear a melody is to grasp the musical pattern or schema that the notes express, and that when we recognize it from the opening phrases or played in a different key, we do so in virtue of the pattern registered as a subordinate organization in the original engram-complex. Similarly, in the recognition of a tram-car by its rumble, a book by its 'feel,' an orange by its smell, the sensations immediately before the mind are apprehended through the activity of concepts or schemas derived from previous experience. In the rumble the mind reads a moving tram-car; in the odour, the taste and appearance of an orange; just as in a printed book it reads what the words mean. In this way while each of us is imprisoned in the circle of his own sensations, we are yet freemen of a common world; though some, being blind or deaf, miss part of it, and a few, like the blind-deaf-mute, Helen Keller, can read it only in terms of the humbler senses.

Perception, the earliest of intellectual activities, is the key by which all the rest may be understood. Philosophers have written as though an almost impassable gulf sundered the humble mental function the animals share with us from the lofty exercise of thought, reserved for man alone. This is but a special case of a misconception which we have already sought to correct (pp. 24-26). Mind uses at all its levels the twin methods of analysis and synthesis;

¹ As in the anecdote of the dyer who could not communicate to others the secret of his wonderful power of mixing dyes. The better-known story of the judge who advised a junior never to give reasons for his decisions, illustrates the further truth that the 'rational' account we give of our actions may be very discrepant from the actual activity of the complexes from which they spring.

the difference between the perceptions of a dog and the thoughts of a sage is a difference not in the nature of the process, but in its range and complexity, and in the materials with which it works.

Let us examine the main points of this difference. We have seen that in ordinary perception the range of the cognitive act often travels far beyond what is immediately present to the senses: I hear not a mere rumble, but a tram-car; I see not a mere yellow patch, but an orange. How far it may go, even in animals, is shown by the behaviour of a dog who, when his master dons a hat, plainly sees the promise of a joyous scamper out of doors. The cognitive acts of an engineer who grasps the working of a machine, of a farmer to whom sky and wind foretell a change in the weather, of a physician who reads in his patient's symptoms the nature and probable course of the disease, differ from the dog's chiefly in using as their vehicle a schema whose range and complexity is much greater still. Thus one mark of the higher mental act is a higher development of synthesis.

A second mark is increased fineness of analysis or abstraction. An intelligent dog can discriminate between his master's assumption of a silk hat and of a soft hat—reading the latter as a sign that he is to be taken out, the former that he is to be left at home; but a child's power of abstraction soon exceeds the utmost limits of canine analysis.¹ For instance, a child of eight, confronted with an oblong, measuring, say, 6 inches by 4 inches, and divided up into inch-squares, can readily see by analysis that the squares fall into four rows containing six each, and so learns, without counting, that the oblong contains altogether 6×4 square inches. Moreover, he can carry the analysis to a stage still more significant in its potentiality; for he can see that the property he has discerned in the figure before him must also belong to any oblong whose sides contain each an exact number of inches. In other words, he has the power of ignoring all the circumstances that distinguish this oblong from others, and of attending solely to a property which, since it depends on the shape alone, must be present wherever that shape is found. It is hardly necessary to point out that this higher development of

¹ Miss E. M. Smith's little book, *The Investigation of Mind in Animals* (Cambridge Press, 1915), gives an interesting account of experiments on the range of intellectual power in animals.

analytic power is the prime essential in mathematical and scientific reasoning. In mechanics, for example, we ignore everything about bodies, except the way they affect one another's movements; in optics we attend only to their behaviour towards light; and so on.

Side by side with the increase in analytic and synthetic power, higher mental acts show another characteristic. The intelligence of animals is, as psychologists say, confined to the perceptual level; that is, they do not, as a rule, concern themselves with situations that are not suggested by objects or events actually before their senses. To this rule there are, no doubt, exceptions. A dog will announce by seductive whimperings that he would like a walk, or may (like the author's terrier) make the hint still plainer by seeking his collar spontaneously and laying it at his master's feet. It is, however, a special mark of men that they constantly concern themselves with objects and events which are not before their senses; and this kind of mental activity is what we generally have in view when we speak of *thinking*. In thinking, the mind deals with schemas or concepts cut loose, so to speak, from the things in the perceptual world to which they belong—in a word, with *ideas*.

The power to think freely—that is, to entertain ideas without the presence and help of perceived objects—varies greatly with the maturity of the mind, with its acquired habits, and with its familiarity with the subject-matter. A child, for instance, may easily be led to find the general rule for calculating the areas of oblong figures, and in discovering it, is certainly thinking. But it is equally certain that he would not make the discovery at all unless his ideas were supported and their flow guided by contemplation of an actual oblong figure dissected into squares. His mind can treat the particular figure not as particular, but as a symbol of all possible oblongs; yet cannot reach a general truth about oblongs except through contemplation of the symbol. The minds of children and of ill-educated persons do much of their thinking by the aid of things used thus as symbolizing concepts which would otherwise elude their mental grasp.¹ Even educated persons of good intelli-

¹ The reader will remember that the clownish Lance (*Two Gentlemen of Verona*, ii, 3) could not explain the manner of his parting with his family except by using his shoes, his staff, and his hat as symbols for his parents, his sister and Nan the maid.

gence can 'see' difficult ideas much more easily when they are presented in concrete symbolism, and there have been minds of the highest order that could work in no other way.¹ Here is the psychological justification for the use of models in teaching abstruse subjects. Undiscerning persons object to models on the ground that their use deprives the pupil of the stimulus to employ his powers of thought and imagination; but we see that, on the contrary, they are for some minds always, and for most minds sometimes, the best possible means of stimulating activity.²

The use of pictures and diagrams comes under the same heading; though, since they are farther from solid reality than models, they are generally less effective thought-instruments. The lines, colours or shading of a picture or photograph are material objects which the mind takes not at their face-value, but as symbols by means of which it reaches and holds a certain schema or idea about the things portrayed. Similarly, a little boy, busy with his 'meccano,' gathers from a diagram the schema for constructing, say, an elaborate model of a travelling crane, and could not keep so complicated an idea 'in his head' except by repeated reference to the drawing where it is symbolized. The same explanation applies, in principle, to the use of symbols in algebra. An algebraic expression is simply a perceptual object whose form symbolizes some particular relation between numbers; and its use is first to enable the mathematician to hold the concept of this relation in mind, and next to pass from that concept to the concept of another relation which 'follows' from the former.³

When a person thinks without the aid of any perceptual object or symbol to guide his thoughts, his ideas are in the full sense 'free.' All of us can deal in this way with familiar objects and events, recalling the past, looking into the future, or pursuing in

¹ E.g., the great Lord Kelvin, who confessed that he could never accept the electro-magnetic theory of light because he could not devise a model of it.

² See Sir John Adams, *Exposition and Illustration in Teaching* (Macmillan, 1909), Ch. XIII.

³ E.g., the expressions $c = (a + b)(a - b)$ and $c = a^2 - b^2$ symbolize two distinct relations that may obtain between three numbers; and the process of manipulation called 'multiplying $(a + b)$ by $(a - b)$ ' is the means by which the algebraist proves that wherever the former relation obtains, the second one obtains also.

idleness the dreams of fancy ; and more gifted and powerful minds can thus follow the ' way of ideas ' far into remote realms of abstruse speculation.¹ But even here thought needs the support and guidance of images, which, as we have seen, are mental copies of perceptual objects, including movements. Visual images, in particular, being a direct transcript of material objects, play a very great part in an average person's thinking and reasoning. Many descriptions of things would be almost unintelligible to most people unless they evoked visual imagery, and many arguments consist essentially in devices for calling up more or less definite pictures of the behaviour of things ² (see pp. 204-5).

We have reserved until last the most important of thought-instruments—namely, language. Language may be the vehicle of ideas either in the perceptual form of spoken or written words, or in the subtler guise of verbal images, visual, auditory or kinæsthetic. Its use is pre-eminently a social habit, and is found in a rudimentary form wherever animals, under the urge of the gregarious instinct, act together in defence or in pursuit of food. From their earliest days children produce sounds that develop, on the one hand, into rhythmic and musical utterance, foreshadowing singing, and, on the other hand, into something that seems, at least to parental

¹ The great Sir W. Hamilton, the inventor of quaternions, is said often to have spent hours in mathematical thought unaided by written symbolism.

² The reader may try the following examples upon himself or a friend.

(a) *Description*.—A certain ' flying top ' consists of three parts : (1) A wheel with spokes like the blades of an electric fan. The hub contains a small hollow cone whose point projects slightly so that the wheel cannot lie flat on a table. (2) A tube, grooved spirally within like a rifle-barrel, and ending in a cone which fits into the hub of the wheel. (3) A rod, bearing a spiral ridge like a screw, which fits into the tube. To start the top, you place the wheel on a table, fit the conical end of the tube into the hub, and holding the rod upright, press it rapidly down into the tube until it reaches the bottom, when you instantly withdraw the rod and tube. The wheel now rises from the table and flies across the room.

(b) *Argument*.—B is a certain distance north of A, C the same distance east of B ; therefore C is north-east of A.

The study of such examples may convince the reader that it is important in many lessons to set oneself deliberately to evoke imagery in one's pupils. The teacher who does not himself use visual imagery freely (p. 205) often fails to keep in touch with his hearers, simply because he and they are employing different symbols or vehicles for their ideas.

admiration, the beginnings of speech. Unfortunately the irrepressible fondness of parents for conversation with their babes makes it hard to ascertain whether infant babblings acquire the central function of language—*i.e.*, the use of words as names for things, actions and relations—in virtue of an innate tendency, or whether this all-important advance is due entirely to teaching and imitation. There is, however, abundant evidence (i) of the normal child's insatiable interest in speech at a very early age, (ii) of his gradually increasing ability to *hear* and repeat the sounds that enter into words and (iii) when this stage is sufficiently advanced, to master rapidly the correct use not only of individual words and phrases but even of speech forms, apprehended and applied by analogy—a power that would seem inexplicable if one forgot the incessant practice children impose upon themselves for more or less serious purposes or in play.

During the first few months a child's 'words' are not true names, they are rather expressions of emotion or indications of desire. Thus even 'dada,' the first word every pious wife tries to teach her babe, remained during the first year of one of Valentine's children a sign that he was 'pleased and interested in a thing,' and perhaps in that way came to be the name for an approved parent.¹ It may well be that in the course of racial history much of what is properly to be called language grew thus out of emotional expressions.

Children notice and like to imitate striking sounds, such as cries of animals or the hoot of a motor horn, but do not use them on their own initiative as names for the things that make them. In short, though onomatopœia is plainly the source of many English words (*e.g.*, 'splash,' 'boom,' 'cuckoo,' 'mew,' 'bark,' and a thousand others) these very natural names are not reinvented by children but are learnt from adults. The same thing is true of words that contain 'sound-metaphors'—such as 'quagmire' and 'quiver,' which hint so clearly at shaking; 'flounder' and 'flop' with the plain suggestion of clumsy movement; the force of the *gr* in 'grumble' 'groan,' 'grouse' (Pearsall Smith). The significance of such words is linked with the inclusion of the thing signified in the

¹ Valentine, Ch. XX, is a rich mine of careful observations on the beginnings and development of language.

speech movements that produce them: *e.g.*, of vibratory motion in *quiver*. Following up this clue, some students have reached the theory that speech is, in part at least, a system of 'oral gestures,' in which the movements of the speech-organs are either residua of or substitutes for larger facial pantomimic and bodily gestures that are natural expressions of feelings, wishes, and objects of thought. As a general account of the development of speech this seductive theory suffers from the weakness that a large number of our more essential words cannot be brought under it.¹ Yet it seems possible that many words owe their meaning and particularly their vigour to association with attitudes and gestures of which the speech-movements that form them are, historically, reduced and refined representatives. The association may have faded completely out of consciousness and yet remains part of the buried complexes whose activity gives the words its meaning.²

This doctrine is supported by the common observation that words originally concrete in meaning tend to become abstract. The word 'tend' is itself an example. The Latin *tendere* originally meant 'to stretch,' and may be regarded as a 'vocal gesture' derived from, or at least connected with, a larger bodily gesture imitative of stretching. The use of the word and the gesture became registered together in a single complex, so that when the word was employed alone, it still had behind it the activity of the whole complex. When the need arose to apprehend the subtler facts we express by 'tendency,' the earlier concept of stretching was used as a symbol by whose aid the notion could be apprehended and communicated. The word would thus come to express the activity of a new complex, but that complex would still contain the older one as its core, and would derive its energy therefrom by 'sublimation.' In this way we can see how it is possible to understand the meaning of a passage—such as the present paragraph—whose reading evokes little or no

¹ Sir Richard Paget is a contemporary writer who presses the gesture theory much further than orthodox phoneticians, and has made interesting observations and suggestions upon the use of gesture as a means of universal communication. See his *Human Speech* (Kegan Paul, 1930), Ch. VII.

² The reader, remembering pp. 204-6, will see that the meaning of object-names, such as 'table,' consists largely in the (unconscious) schemas of our activities connected with the objects.

imagery except, perhaps, auditory echoes of the words themselves. The words awaken the largely unconscious activity of engram-complexes which the synthetic power always inherent in mind rapidly organizes into a complex of new form and wider scope; and it is this complex, growing as one reads, which determines the 'attitude' towards the sentences wherein our awareness of their meaning is felt to reside.

The tendency to employ primitive experiences as means for grasping and expressing the significance of more complicated and subtle facts must now be recognized as almost omnipresent in human mentality.¹ It explains the forms of myth, ritual and religious creeds, it runs riot in dreams, and may be said, in short, to be the key to understanding much of the development of civilization. In the history of physical science, for instance, nothing is more striking than the way in which men have persistently sought to interpret recondite phenomena in terms of such familiar things as bodily exertion ('force,' 'energy'), the behaviour of moving bodies ('atoms,' 'electrons'), or of water ('ether').² Poetic imagination, following a different impulse, uses the same means. The poet is a man for whom the common sights and events of the world are symbols of things which the rest of us could never find without his aid. 'To scorn the imagination,' says Robert Lynd (see p. 69), 'is to be a blind man deliberately refusing the miracle of sight. It is imagination that cleanses the scales from our eyes, and awakens our senses to the real things that surround us.' To the unimaginative man the yellow primrose is a yellow primrose, and 'nothing more.'³

The foregoing discussion has covered, in principle, all forms of higher intellectual activity. It is, however, desirable to add further

¹ See E. Jones, *Papers on Psycho-Analysis*, 2nd ed., Ch. VII.

² T. P. Nunn, *Aims and Achievements of Scientific Method* (Macmillan, 1906, and *Proceedings of Aristotelian Society*, 1905-6).

³ Samuel Butler, who missed no chance of girding at Wordsworth, speaks in his *Alps and Sanctuaries* of 'the primrose with a yellow brim,' adding 'I quote from memory.' Dean Alington relates that he had once the joyful experience of reading a copy of the book in which a previous borrower had written 'No' against the passage, and had entered in the margin the correct quotation! This delicious anecdote is a perfect illustration of the connection between imagination and humour.

remarks upon two—*invention* and *reasoning*—in which the creative aspect of the activity is especially prominent.

An act of invention may either modify an existing schema in some essential details—a classic instance is the act of the ingenious lad who, by attaching strings, made the steam-engine he tended work automatically—or it may produce what is virtually a new schema—as when Arkwright, or some predecessor, transformed the spinning wheel into the spinning machine. But the invented schema, however novel, is rarely anything but a new synthesis of familiar schemas or their components. Bring together a pumping-engine and a tramway-wagon, and you have a railway locomotive; synthesize the gas-engine with the road-carriage, substituting oil-vapour for gas, and you have the motor-car; and so on indefinitely. The inventive mind possesses in a higher degree the analytic and synthetic powers common to us all. Unlike routine-bound minds, it readily separates the elements of things from their usual contexts, and it is fertile in new constructions. Above all, it has the energy that expresses itself in the strongly sustained purpose needed to make good use of those gifts.

There is, in principle, no difference between this kind of invention and the invention of a writer like Defoe, who, given a certain imagined situation, produces in the adventures of Robinson Crusoe a plausible synthesis of possible incidents. The only distinction is that the schema of the romancer is for delightful contemplation, not for use. On the other hand, there is a substantial difference between invention and fancy. For fancy, although, like invention, it weaves its schemas out of real materials, takes no heed to make the pattern as a whole congruent with reality. The difference may be illustrated from a fairy story—told by the famous mathematician, W. K. Clifford—of a giant whose favourite food was white bread and butter strewn with light-brown *horses*!

Reasoning covers much the same ground as invention; for the essence of both lies in the deliberate search for a new schema, and in an intention that it shall be congruent with reality. The lazy boy who made his engine function by itself must have seen that the strings would 'work'; Defoe saw that Crusoe could not have goatskin garments without the means of making them. Both, then, reasoned—that is, constructed schemas in which they believed that

there was no element contradicted by other schemas derived from experience. Most of the reasoning of science—at least of non-mathematical science—is of this type. For instance, a geologist explains a fossil by the hypothesis that it is the petrified skeleton of an extinct animal that died where it was rapidly covered up by sea-mud or river silt; for this is the only schema, congruent with reality, into which the facts will fit. The reasoning of the physical sciences differs from this type in two respects. In the first place, it is essentially analytic; that is, it does not consider things as concrete wholes, but seeks ‘laws,’ such as Newton’s laws of motion, or the laws of magnetic attraction and repulsion, in which certain abstract features of their behaviour may be summarized. In the second place, it seeks, in a manner already indicated (p. 231), to interpret, and to reduce to unity, wide ranges of natural phenomena by means of such symbolic ideas as ‘force,’ ‘atoms,’ ‘ether-waves.’ But, as the scientific reader will see, these subtler developments do not carry it outside the description we have given of the more elementary types. Mathematical reasoning carries abstraction still further than physics: so far indeed that it sometimes appears to have no touch with the actual world. But that is not really so. All numbers, whether fractional, irrational, complex, transfinite, or the still more artificial inventions of modern *savants*, are only elaborations of the numbers a child uses in counting; and their uses in algebra, the calculus, function-theory and the rest, are guaranteed in the end by the simple facts of counting. Similarly the inventions and demonstrations of geometry are ultimately based upon the relations of physical things—even when they carry research into imaginary spaces of many dimensions.

Since the first edition of this book appeared much has been written about a new *Gestaltpsychologie* or ‘form-psychology.’ This version of the science is wholly in accord with the doctrine set forth in these pages and inspired by earlier, mainly British authorities—though we have to thank the younger German workers for valuable experimental corroborations and illustrations, much theoretical development, and some useful applications in education. In brief, the doctrine is, as we have so frequently said or implied, that the reaction of a living organism to environmental change is never

merely a reaction in the sense physical science gives to the term, but a *response* or answer. On the one hand, the sensitivity of the creature is not the passive sensitivity of a photographic plate, but a constructive or creative sensitivity which cognizes the situation presented to it under some schema, pattern or form, rudimentary or elaborate as the case may be. And on the other hand, its movements in reply (if movement occurs) are not merely mechanical, even when their main lines are determined by instinct and carried out by reflexes, but are shaped into a pattern conforming with the pattern under which the external situation is cognized.

In the field of animal behaviour these principles have been delightfully illustrated by the experiments of Wolfgang Köhler (one of the *Gestalt*-psychologists) upon the mentality of apes.¹ Relying upon the restless curiosity and motility of these animals and their insatiable appetite for bananas, Köhler arranged a number of situations in which the fruit could be secured only by some indirect movement or some more or less difficult manipulation. In dealing with these situations the animals showed differing degrees of intelligence, just as human beings in like case would do. As a rule their achievements were limited to an intelligent use of things that lay before their eyes; for instance, if a banana was hung above their reach they would fetch a box from the corner of the cage and place it beneath the prize, and would, if necessary, even put a second box on top of it. And most of them had sense enough not only to 'fish' for the desired banana with a stick, but also to push the fruit to the opposite side of an enclosure if it would there be possible to reach it. That is, they were capable of basing their actions upon a fairly complicated schema or pattern of the situation. But the ape Sultan, the genius of the group, went much further than this. He had learnt in pure play to fit a thin stick into the hollow end of a thicker one, and cleverly used the long implement to bring distant bananas within reach. And alone among the apes he rose to the intellectual height of fetching a ladder from outside the cage in order to climb up to the suspended fruit.

We have maintained that there is no difference in principle

¹ The second edition of Köhler's book has been translated under the title *The Mentality of Apes* (Kegan Paul & Co., 1925).

between intelligent behaviour on the perceptual level and the abstract reasoning of which only men are capable, and the results of Köhler's fascinating experiments strongly fortify that position.¹

But though what has been published by the *Gestalt* school does not seem to entail any modification of our doctrine or any important addition to it, there has, since 1920, been an advance in another direction which promises most valuable guidance to educational theory and practice. We refer to a work² in which Spearman has shown that cognitive activity of all kinds can be reduced to the operation of a few simple principles. The first principle states that any experience which (as the Germans say) one 'lives' tends to 'evoke immediately a knowing of its characters.' It may, for instance, be known as having the character of a colour, such as green, or of a particular sound or smell, or of an act of will. And with the character of the experience there tends also to come 'a knowing of the experienter.' Not only do I, for instance, become aware of the green; as a rule I become at the same time aware of myself as seeing it.

The second principle rests upon the distinction between objects of any kind and the relations in which they stand to one another. There may, for instance, be two patches of green, A and B, of which A is, as a matter of fact, both darker and bigger than B. Now I may (in accordance with the first principle) see each patch as it actually is without at the moment observing that A is deeper in shade and greater in size than B; but the second principle asserts that I shall *tend* immediately to do so. Thus, in a more complicated case, a non-musical person may at first hear in a Bach fugue nothing but a hotch-potch of sounds. He may apprehend their individual characters more or less adequately and yet be able to 'make nothing' of the music as a whole. After sufficient repetition, however, he will as a rule apprehend that there are, between the notes of a particular set, relations which give it a definite melodic

¹ A headmaster to whom the author chanced to speak of Köhler's book replied with enthusiasm, 'Ah! there you have schoolboys perfectly portrayed!' Reflection upon the problems of teaching will bring out the significance of the remark.

² See p. 246.

character or form. What he now hears is the 'subject' of the fugue; and having apprehended it, he will be aware of numerous repetitions of the same form at different levels of the musical gamut. In other words, he will now apprehend the relation of identity of form as subsisting between several sets of actually different notes. And in that way he may advance to the ultimate apprehension of the whole complicated musical structure.

The third principle is the converse of the second. Some one strikes a note upon the piano, bidding me sing its octave; and I at once produce the note demanded. That is, I have before me a note of a particular character and a relation which that note bears to some other not yet in being; and the note with the correlative character at once comes into my mind. Or, to take a more complicated instance, the orchestra at a theatre stands up and sounds a particular chord, and at once the audience sings 'God save the King' in the correlative key.

Here, then, are Spearman's three 'noe-genetic principles,' or principles of cognition; namely, 'apprehension of experience,' 'eduction of relations' and 'eduction of correlates.' It is not possible to follow him through the chapters in which he has used them to reduce to an orderly, rational system what has hitherto seemed little better than an assemblage of 'faculties' or functions without any organising principles; perception, memory, imagination, conception, judgment. One can only say that his analysis has that revealing simplicity which makes one wonder why the thing was not long ago discovered. There seems to be nothing in it which conflicts with the doctrine we have developed, but it clarifies that doctrine in a high degree. For instance, it justifies the view that there is no difference of plan between intelligent perceptual activity and abstract reasoning, by showing that in each case the same principles operate, but at different levels. And it makes much more precise the notions of a schema and of analytico-synthetic activity upon which we have constantly relied, by exhibiting their structure in a clearer form. Again, from the point of view of educational practice as distinguished from theory, these principles of cognition are likely to be of special value, since they offer a sure and definite basis for criticism of procedure in teaching. In fact it is hardly too much to say that they make unnecessary any logical

considerations and criteria that do not flow obviously from themselves.¹

Spearman's doctrine that perception merges naturally into 'reasoning,' is strongly supported by the ingenious and careful studies Valentine made of what he justly calls a supremely important topic in the psychology of thinking²; namely a child's growing power of apprehending relations. This is exhibited partly in the use of prepositions and conjunctions ('in,' 'of,' 'with'; 'because'), partly in verbal forms (generally incomplete) that imply relational education. Valentine's conclusion is (p. 495) that by the age of 2; 0 most of the types of relation in Spearman's list seem to be apprehended, and that most of these are definitely expressed in language by about the age of 2; 6.

Reviewing the whole discussion, we may say that self-assertion, as far as it is expressed in cognitive activity, has always the same immediate aim—an aim that may be described as the intellectual control of the world in face of which the individual maintains his creative independence. That aim appears, on the threshold of life, in acts of perception; the babe who delights in the brightness of a silver spoon or recognizes it as a toy or an implement, has already achieved some measure of intellectual control over it. But as the mind matures, there grow out of this unconscious immediate aim three lines of conscious purpose, which, though they constantly come together, are perfectly distinct in character. These we may distinguish as practical, æsthetic and ethical. Let us consider them briefly in turn.

The practical tendency of much of our cognition is obvious. It is obvious, for instance, when a traveller inquires the way to a place in order to get there, or when a tyro asks an expert chauffeur to explain the uses of the levers, so that he, too, may drive the car. Scientific inquiry frequently aims directly at practical control, though in some instances the practical motive may be or seem to be absent. A schoolboy who seeks an explanation of eclipses certainly does not expect to be able to bring them about when he

¹ The reader should practise the application of the principles to the analysis of acts of reasoning, of invention, of imagination, etc., which occur in school teaching and learning (see p. 232).

² Valentine, pp. 455 *et seq.*

pleases ; but his mental attitude is, nevertheless, that of one seeking control. It is, in fact, clear that one's mental grasp of eclipses is incomplete until one can at least *predict* when they occur. This remark shows that the practical motive may lurk, in a subtle form, even in the most 'disinterested' scientific thought. The chemist who affects to despise the industrial applications of his science still hungers for the knowledge that gives control over the transformations of matter ; the 'pure' geologist still presses for the kind of understanding of the earth's structure that we might ascribe to the *demiourgos* who made it.

In his Gifford Lectures,¹ which sum up the studies and arguments of thirty years, John Dewey has stated this position in a still more radical form. His standpoint is frankly and completely 'behaviourist' (p. 29). For him knowledge consists entirely in those human manipulations of present reality which aim at, and succeed in, reshaping it to the fulfilment of some human purpose. For instance, knowledge of electrical theory is merely our power to produce electric light, to run electric trains, to send wireless signals and to do other things of the kind. If men understood this truth they would not think of knowledge as directed primarily towards any pre-existing and enduring objects, such as the 'ideas' of Plato, the 'axioms' of mathematics, the laws of motion of Newton, electrons, ether or any other entities supposed to underlie and 'explain' the world's flux. The observable flux itself is all there is, and knowledge is merely our experimental control over it. And since the world, largely owing to man's interference with it, is constantly changing, knowledge itself must not *grow* but *change*. For if knowledge means the power to produce something new, there can be, strictly speaking, no knowledge of the old ; the old merely *exists* as a starting-point for fresh knowledge. Applied in the social or moral sphere, this theory implies that there are no eternal moral principles which men 'ought' to follow ; what we 'ought' to do now is not what our grandfathers 'ought' to have done, for our world is not theirs. The morality of an industrial age, with vast concentrations of population, complex communications and immense technical powers, cannot be the same as that of one of the old simple communities.

¹ *The Quest for Certainty* (Allen & Unwin, 1930).

This doctrine has evidently a most direct and drastic bearing upon educational theory. Instead of seeking to preserve the 'culture' of the past, it would concentrate upon the present, and aim constantly at fostering in boys and girls at school the experimental attitude towards its material, economic, hygienic and moral problems—teaching them to realize that these cannot be separated but are all aspects of the one great problem of increasing the welfare of mankind. It would be idle to deny that teachers everywhere have much to learn from such a gospel, even though one may think that there is more to be said for ideas and their rôle in human progress than Dewey would grant; also (to quote another famous American) that his report of the death of the Past is 'greatly exaggerated.' To be convinced of that one needs only to look around upon the Europe and the America of to-day.

In our exposition we have admitted that even 'pure' science aims at intellectual control over the course of nature, and one may grant that this aim is at least often inspired by the desire for practical control. But it seems a little perverse to maintain that the significance of inquiries such as those of Newton, of Faraday, of Darwin, of Einstein lies wholly in the increased command over nature to which they have led or may lead. Inquiries of these kinds have a purpose which, though scientific in so far as they are objective, that is directed towards what *is*, approximate to the æsthetic purpose. And although art is also allied to utility it would seem impossible to reduce the first of these things wholly to the second. For when the aim of cognition is practical, the analytic and integrative powers of mind carry their work only as far as is necessary for the task in hand. The anxious traveller takes note of the features of town or landscape only in so far as they are landmarks guiding him to his destination. A physicist or a chemist limits his observation to facts that may have a bearing on the question he is examining. But the distinguishing mark of æsthetic activity is that it seeks after the perfection of the analytico-synthetic process as an end in itself, without regard to any further purpose it may serve. Here, in substance, is the answer given by the Italian philosopher, Benedetto Croce, to the question, What is art?—a question which, from the time of Plato, who regarded art (and condemned it) as a mere

imitation of nature, has sorely vexed the philosophic mind. Art and beauty, says Croce, are successful *expression*, or as we have put it, the perfect development of the analytico-synthetic process of intuition. The artist who creates a beautiful painting of a face or a landscape does not aim at producing a faithful copy of what is there for every one to see; his purpose is to record the 'intuition' or 'expression' evoked from him as he contemplates his sitter or the country-side. He may even make a beautiful picture out of what is 'naturally' ugly—that is, out of something which frustrates the effort of an ordinary person to see it and to feel it as an individualized whole. And when we have learnt how the artist's vision has transmuted the bare and ugly facts, we, too, may find beauty in them—that is, may be able to contemplate them in a successful act of expression.¹

It follows that the true work of art is the constructive or creative process in the artist's mind, and that the audible poem, the visible painting or sculpture is only a record of this process and a means by which it can be communicated to others. It follows also that when communication occurs, that is, when we 'appreciate' an artist's work, we ourselves repeat, as fully as we are able, the creative movement in which he brought it to birth. This corollary is no doubt substantially sound and its bearing upon the problem of æsthetic training highly important. It implies that appreciation is not the passive observation of the beauty incorporated in a poem, a statue, a painting or a musical composition, but an active reconstruction of the mental movement which produced it.² That is why, for instance, the same poem or piece of music may sometimes fill us with æsthetic excitement and at other times leave us cold; all depends upon whether and to what degree our mental movement reproduces the original creative process. In this province, then, the teacher's aim must be to find what conditions are most likely to assist the reconstructive process in the pupil's mind, and to

¹ R. Browning's *Childe Roland to the Dark Tower Came* is a striking example from poetry.

² In his treatise *On the Sublime* the ancient critic Dionysius or Longinus seems to have come near to this doctrine: 'The true sublime, by some virtue of its nature, elevates us; uplifted with a sense of proud possession, we are filled with joyful pride, as if we had ourselves produced the very thing we heard.' ('Loeb' Edition, trans. Sir W. H. Fyfe, p. 139.)

exploit them. That is not to be done by enthusiastic praise or meticulous criticism, and is not likely to be done at all unless the teacher can preserve in himself the vitality and freshness of his own æsthetic experience.

The philosopher Samuel Alexander, the most considerable of recent English writers on æsthetics, agrees with Croce that every work of art is the offspring of a constructive or (as we say) an analytico-synthetic process that aims only at its own perfection; and he accepts Croce's view about appreciation.¹ But he finds essential importance in the materials that, in Croce's theory, have value only as a record. For him, in all but a few exceptional cases, the work of art is created progressively as the result of interplay between the artist's mental excitement and the material he handles: the sculptor's clay, the painter's pigments, the massive materials that take shape in the architect's building, the phrases built by the poet into his 'lofty rhyme,' the tones and tone-relations woven into the musician's composition. From that interplay the work of art emerges in the way indicated in the footnote on p. 51 of this book.

As a rule an artist finds his inspiration in a *subject*, which awakens his constructive passion and for a while possesses his mind. But although a poet's passion may play about an actual Grecian urn and a portrait-painter may work from an actually present model, the work of art is never a mere description or representation of the subject. The artist (says Alexander) always adds something of himself to the material, and without that addition there would be no work of art, only, perhaps, a clever and attractive piece of craftsmanship.² One art, however, lies outside the rule; for, as Alexander insists, the only subject-matter in music is the sound-form itself.³ That is why musicians dislike such popular names as 'Moonlight Sonata,'

¹ S. Alexander, *Beauty and Other Forms of Value*, 1933, p. 30: 'There is no difference in kind between æsthetic appreciation and æsthetic creation. The one is the pale shadow of the other, as passively at the suggestion of the recovered work the spectator recovers the creator's mind.'

² The addition may consist in bringing to light features that the artist feels to be more significant than those visible to the ordinary eye. This is presumably what Aristotle meant when he declared that tragedy is 'more philosophical' than history; that is, more significant of the fundamental things in human life.

³ Drawing, painting and sculpture that aim at pure perfection of pattern make other exceptions.

which claim the discovery of an external subject where none exists. Indeed, would anyone, without knowing the title, discover (say) in Elgar's *Cockaigne* overture, a picture of London life, or in Schumann's best-known tune the outpouring of 'a peasant returning from his work'? It is true that subject-titles are prefixed to a great many musical pieces, and that 'to a certain extent these titles can be explained in a sense that does not detract from the simple musical worth of the pieces which bear them. That is to say, they may be regarded as extra marks of expression, or as indications of the temper in which the composition is to be performed. All the same, it is undeniable that the music has often withered under a literary blight.'¹ When the connection between title and piece seems to be more organic than is here admitted, the subject (*e.g.* an emotion or an external scene such as the rough sea in Wagner's *Flying Dutchman*) does not appear in the music as it would appear in a poem or play, but is nevertheless transformed by mysterious chemistry into 'something rich and strange' embodied in the purely musical texture of the composition. This remark applies very clearly to the musical setting of a song; the music does not say again what the verses have said, but it accords with them in temper. When the accord is at its highest Milton's metaphor, 'married to immortal verse,' itself described perfectly the æsthetic fusion. In this sense music may be 'married' even to philosophic feeling, and so justify Lotze's oft quoted saying that great music reflects movements pervading the whole universe. Lastly, in dancing and the ballet æsthetic fusion between music and bodily movement may reach a high level of completeness.

¹ Quoted from E. J. Oldmeadow, *Schumann* (1910), p. 21. 'Literary blight' was not far away when a critic introduced Mozart's G minor symphony to a 'wireless' audience as a tragedy, and justified the gay tone of the third movement by pointing out that a tragedy needs light relief, such as is given by the gravedigger in *Hamlet* and the fool in *Lear*. The confusion of values is regrettable even here; it becomes a bewildering chaos in the declaration of a German critic that Beethoven's Fifth Symphony contains a whole system of ethics and metaphysics! It is, perhaps, relevant to observe that Beethoven gave two explanations of the four-note phrase with which the symphony opens: (1) that it represents 'Fate knocking at the door,' and (2) that it was suggested to him by the sound of a wood-pecker. During the war it acquired (*via* the Morse telegraphic code) a third significance: 'V for Victory!'

If the foregoing argument is sound, to press children to divine the subject of the music played to them in an appreciation-lesson is bad pedagogy; for it diverts attention from what should be an æsthetic enterprise to an intellectual problem—and one that is, strictly speaking, non-existent.

On p. 89 we found reason to think that the gift of æsthetic creation (and hence of re-creation) is much more widely spread than is usually supposed. The remarkable results won by some outstanding teachers of drawing and music and by teachers of English who have made their classes breeding-grounds for young poets and dramatists confirm this view. Still wider confirmation comes from the 'indiscriminate herd of us who find nature beautiful and do not even know that we are unconscious artists.' For the beauty we see does not reside in nature; it is the fruit of a creative movement in which the observer, 'adding something of himself' to the scene, unconsciously selects and combines its features under the influence of æsthetic excitement.¹

Scientific and æsthetic activities are, then, modes of self-assertion directed towards the external world—which may here be taken to include the facts of our physical and mental nature and also such things as the words we frame and the musical tones we produce. The aim of each mode is constructive control, the decisive difference between them being that while science, whether it seeks practical control or stops short at the intellectual control called 'understanding,' can attain its goal only by faithful submission to facts as they actually are, æsthetic control *plays* freely with facts for the sake of its own satisfaction. Both may be very complex forms of activity; for the artist in most *genres* must be an accomplished craftsman, and the sciences, especially modern physics and astronomy, demand constructive and even engineering skill of a high order. Nevertheless a craftsman is not an artist nor an engineer a man of science unless his intellectual activity follows one of the lines we have distinguished.

In turning from science and art to morality and ethics we are

¹ Alexander, *op. cit.*, p. 31. Cf. Goethe as reported by Eckermann: 'Claude Lorraine knew the real world by heart to its smallest details, and used it as a means of expressing the world of his own fine soul.'

still in the realm of constructive self-assertion, but we now find it directed away from the outer world towards human conduct and the significance of man's inner life. Human conduct is what morality would control, its significance is what ethics would understand. We have already learnt that a child's moral development begins in the compulsion he feels to bring his impulses and desires into harmony with those of others (p. 194). Thus ethical knowledge is at first a special kind of practical knowledge—being practical knowledge applied to the control of one's own conduct in social relations. But, as his moral insight deepens, he comes to see that, while the end of moral activity is always individual good, that good can be realized only if it is identified with a universal good. Henceforward, ethical cognition is a search for the universal principles of conduct which *must* be followed though the sky fall.¹

In his last book² Henri Bergson distinguishes these ethical levels as the morality of the 'closed' and of the 'open' society. On the lower level the obligations to which conduct responds are those inherent in membership of a particular tribal or national community; at the higher level obligation has no such limit: it is felt to extend to the whole world. Bergson argues with force and eloquence that the moralities of the closed and open societies spring from entirely different sources. 'Closed' morality, however much it may have been enlightened by intelligence and shaped by history, remains always the expression of an instinct which rules the life of men in societies as imperatively as instinct in bees rules the life of the hive. 'Open' morality has not this impersonal character, but is due to a few great moral geniuses who, rising far above the

¹ The 'must' in this sentence is, of course, not the 'must' of necessity but the 'must' or 'ought' of moral obligation. The passage from the first of these to the second is traced with profound insight by R. Bridges in *The Testament of Beauty*, Bk. IV, *vv.* 90 *et seq.* In brief, his argument is that 'the imperative obligation' is 'necessity become conscient in man.' 'The duteous call was gotten in course of nature,' being but the 'must' of instinct contemplated in consciousness. But 'when and whereas Conscience transfigureth the Instincts . . . we find Duty is thereby extended in the moral field.' The 'call' now comes 'no longer only to affirm but sometimes to oppose the bidding of instinct, positing beside OUGHT the equivalent OUGHT NOTS.'

² Translated by Andra and Brereton as *The Two Sources of Morality and Religion* (Macmillan, 1935).

ordinary human level, have in time drawn the masses of civilized men at least some way after them. So it comes about that, in societies uncorrupted by fatal moral disease, the current morality is an imperfect fusion of the 'open' with the 'closed.' For instance, the average man may admit the beauty of all-embracing charity, yet cannot bring himself to love the enemies of his country.¹ And since social morality is, as Bergson says, a solidarity imposed upon the individual life, he may find it impossible even to pray with conviction for those who spitefully use him. Nevertheless, such attempts as he may make in these directions, though sadly unfruitful, may still make him a better man.

To this meagre account of Bergson's theory of the two moralities we must add a reference, still balder, to his doctrine of the two-fold source of religion. The religion of the ancient world and of a great part of the world of to-day plainly arose to supplement and safeguard the morality of the closed society. Its widely different beliefs—belief in the *mana* of physical objects, in the quasi-personality of rivers and life-sustaining fountains, in the vague 'numinous' beings that waited through life upon the Roman, in the society of clearly-outlined deities which the livelier Greek mind envisaged—these, says Bergson, all emerged as defensive reactions against the dangers to individual and communal life that intelligence disclosed and often created. The higher type of religion, like the open morality it parallels and supports, is due entirely to exceptionally endowed beings, such as the great Christian mystics, who believe that they have achieved direct experience of a spiritual reality behind the veil of phenomena, and have found it to be ineffable love.²

¹ It is only too evident that, on the outbreak of war, morality in the countries involved reverts quickly to that of the closed society, accentuating in a remarkable way both its good and its evil features. As Freud would express it, self-identification with those outside the national family is suspended.

² Compare with the philosopher's exposition the poet's, 'of imagination all compact':

The loved and loveable whose names live evermore,
the sainted pioneers of salvation, unto whom
all wisdom won and all man's future hope is due;
and with inspiration of their ampler air we see
our Ethic split up shear and sharply atwain; two kinds

Their secret visions, communicated through their disciples and remoter followers, have profoundly influenced the better part of mankind, who (as in the case of morality) follow haltingly and inconsistently religions compacted of the two kinds in different proportions.

NOTES ON BOOKS, ETC.

H. STURT, *The Principles of Understanding* (Cambridge Press, 1915), develops in a most interesting and instructive way the notion of the 'schema.' The student should also read J. DEWEY, *How We Think* (Heath, 1909). K. KOFFKA, *The Growth of the Mind* (Kegan Paul, 1924), applies the 'form-psychology' to the study of children's mental growth. C. SPEARMAN, *The Nature of 'Intelligence' and the Principles of Cognition* (Macmillan, 1923), is a full exposition of the doctrine summarized on pp. 235-7. B. CROCE, *Estetica* (1912), has been translated by D. Ainslie (Macmillan). A clear account of his views is given in WILDON CARR, *The Philosophy of B. Croce* (Macmillan, 1917), and they are compared with those of other philosophers in E. F. CARRITT, *The Theory of Beauty* (Methuen, 1915). On the origin and development of gesture-language and speech, the serious student should consult W. WUNDT, *Völkerpsychologie*, Vol. I, Pt. I (Leipzig, Engelmann, 1904). An excellent semi-popular account of 'word-making' will be found in L. PEARSALL SMITH, *The English Language* (Home Univ. Series). S. ALEXANDER's most systematic treatment of beauty, truth and goodness is in his *Beauty and Other Forms of Value* (Macmillan, 1933).

diverse in kind there be; the one of social need,
lower, still holding backward in the clutch of earth,
from old animal bondage unredeem'd; the other
higher and spiritual, that by personal affiance
with Beauty hath made escape, soaring away to where
the Ring of Beauty closeth in the Vision of God.

(BRIDGES, *Test. of Beauty*, IV, ll. 237-47.)

The reader will note that the two types of morality and religion may, without violence, be brought under the distinction between conservative and creative activities.

The School and the Individual

As our argument has developed we have been led to give increasing weight to the social factors in school life ; and the reader may have an uneasy feeling that we have thus drifted away from the position we took up at the outset of our inquiry. To round off our task we must, therefore, consider more definitely the relation between school life and studies and the spiritual growth of the individual pupil.

Few things are more deplorable than the weakening of individuality, the chilling of enthusiasm, the disillusion, that too often attend the progress of a boy through a school which has, and in the main deserves, the reputation of being 'good.' Such a school rarely fails to level up its weaker members, but may cancel much of its good work by levelling down those of richer promise. In part this result is due to forces that cannot be wholly eliminated. The boy is always near to the barbarian, and his societies, if left to themselves, naturally develop the characters of a primitive tribe where custom rules with rod of iron, and eccentricity is ruthlessly suppressed. In part it is due to the excessive use of competition—in which the school reflects one of the greatest evils that afflict the modern world. But behind and deeper than such causes one may suspect the influence of the erroneous ideas about the relation between the individual and society which were pointed out in the first chapter (pp. 10-11). There is the thought, working obscurely or openly held, that social conduct involves the sacrifice of individuality, not its enrichment ; that it means self-surrender, not self-fulfilment.

The root error here is the assumption that the difference between 'selfish' and 'social' conduct coincides with the difference between conduct that is, and conduct that is not, conditioned by the social instinct. Social factors often play an essential part in the most selfish conduct—as in that of the swindler who owes both his knowledge of human weaknesses and his skill in exploiting them to the possession of strong gregarious impulses. And the most clearly

'social' conduct always implies a strong self behind it. For instance, the cultured missionary who cuts himself off from civilization to minister to a degraded tribe in a fever-haunted land, surrenders a great deal, but he does not surrender his self. On the contrary, his conduct is unintelligible except as the self-assertion of an unusually strong individuality.

These examples bring out the true characters of selfish or anti-social conduct. There is conduct which, in the fine words of Kant, uses other persons merely as means, and not also as ends in themselves. This is the sin of the man who condemns others to degraded or empty lives in order that he may grow rich, of the mother who uses the devotion of her children simply for her own ease—in a word, the sin of exploitation in its myriad forms. Again, there is the conduct of persons who, while making use of the gifts and labours of others, deny, in effect, the reciprocal obligation to put something of their own creation into the common stock. One thinks here of the idle landlord or *rentier*, of the literary or artistic dilettante absorbed in the refinement of his own taste, of the great Cavendish concealing his wonderful scientific discoveries. Conduct of these kinds seems clearly to be selfish or anti-social, and anti-social conduct—apart from cruelty and violence—is, perhaps, always of one of these kinds.

As we have seen, developed conduct almost always includes a social reference, for it issues from a self permeated with social factors. Thus it is easy to hold that social value or 'utility' is the one criterion of good and bad conduct. But although this is an excellent criterion for daily use, it may be doubted whether it is ultimate. The belief that conduct is not good because it has social utility but has social utility whenever it expresses some perfection of the individual life may rest upon a deeper foundation. Not to speak of sins of 'self-indulgence,' which are censured with a severity that takes little account of their probable social results, immediate or remote, we have to recognize the impossibility of assessing the social consequences of many momentous decisions. Who, for instance, could determine, on grounds of social utility, the nice question whether a given person should devote his life to clearing up the obscurities in *Æschylus* or to improving the practice of agriculture? When we give due weight to such considerations,

we find it impossible to judge conduct, in general, by any external criterion, and have to fall back upon the principle that human lives, like works of art, must be judged by their 'expressiveness.' However we interpret the phrase or conceive the fact, our bodies, or rather our 'body-minds,' are meant to be temples of the Holy Ghost, and though we are left free, each to work out his own plan, we are bound to make the building as fair as the materials and the powers at our disposal permit. Or, we may say, our ultimate duty is not to let our nature grow untended and disorderly, but to use our creative energies to produce the most shapely individuality we can attain. For only in that way can we be, as we are bound to be, fellow-workers with the Divine in the universe. This canon is not one by which we can measure out our conduct beforehand; for a creation cannot be judged until it has appeared, and it may for a while baffle men's judgment even then. No one, for example, doubts now that Keats chose rightly when he deserted 'plasters, pills, and ointment boxes' for poetry; yet eminent critics of the time held with firm conviction the opposite opinion. But although the canon is not usable like a foot-rule, it may still be the ultimate standard of human worth; and we may have faith that it will never be found in the end to collide with the canon of utility.

We conclude, then, that the idea that a main function of the school is to socialize its pupils in no wise contradicts the view that its true aim is to cultivate individuality. We have pointed out (p. 16) that this aim does not imply the cultivation of eccentricity, nor assume that all children are potential geniuses. As Carlyle wisely remarks,¹ the merit of originality is not novelty but sincerity, and that merit may be earned by one who is not, in the ordinary sense, original at all. But sincerity is an achievement possible only to those who are free to follow the larger movements of their own nature; to take from others not what is imposed upon them, but what they need to make their own. Hence, while the school must never fail to form its pupils in the tradition of brotherly kindness and social service, it must recognize that the true training for service is one that favours individual growth, and that the highest form of society would be one in which every person would be free to draw from

¹ *Heroes*, Lecture IV.

the common medium what his nature needs, and to enrich the common medium with what is most characteristic of himself (see p. 13).

Thus we reach once more the principle (p. 185) that the proper aim of education is positive, to encourage free activity, not negative, to confine or to repress it. What becomes, then, of the concept of *discipline* which is so essential in the traditional ideas about school training? To gain a clear answer to this question, we must first distinguish between discipline and school *order*, and see that though they overlap and indeed interpenetrate, they are derived from quite different psychological roots. School order consists in the maintenance of the conditions necessary if school life is to fulfil its purpose: and, as we saw (p. 70), is most effective when based on imitation and the routine tendency. Discipline, on the other hand, is not an external thing, like order, but something that touches the inmost springs of conduct. It consists in the submission of one's impulses and powers to a regulation which imposes form upon their chaos, and brings efficiency and economy where there would otherwise be ineffectiveness and waste. Though parts of our nature may resist this control, its acceptance must, on the whole, be willing acceptance—the spontaneous movement of a nature in which there is an inborn impulse towards greater perfection or 'expressiveness' (p. 39).

Thus the process of discipline is akin to consolidation (pp. 54-5); it may, in fact, be regarded as a higher type of consolidation, differing from the lower type in that it involves some degree of conscious purpose. We may properly speak of the movements of an athlete as disciplined; for they have gained their perfect form and efficiency—in a word, their expressiveness—largely through conscious effort. Similarly, we may speak of a person as disciplined by circumstances when he has deliberately used the lessons of hard experience to give shape to his impulses and powers. But though a person may discipline himself, as those do who rise to greatness in spite of hostile circumstance, yet discipline is, in general, the influence of a wider or better organized mind upon one narrower or less developed. In all cases there is, in a disciplinary process, a definite psychological sequence. First there must be something that one genuinely desires to do, and one must be conscious either of one's inability

or of someone else's superior ability to do it. Next, the perception of inferiority must awaken the negative self-feeling with its impulse to fix attention upon the points in which one's own performance falls short or the model's excels. Lastly, comes the repetition of effort, controlled now by a better concept of the proper procedure, and accompanied, if successful, by an outflow of positive self-feeling which tends to make the improved schema permanent.

We have had (p. 181) a simple instance of this two-phase process in Jack's behaviour during and after his first tram-ride. The discipline a child gains at school from his teachers and his comrades is of the same character. It is a directive influence, which shows him the better way and stimulates him to make it his own. The discipline of a fine school tradition works in the same way. The eager boy is impressed by what he feels, however obscurely, to be an ample and worthy manner of life, and is proud to become an exemplar of it. Nor is there anything essentially different in the discipline derived from school studies, such as mathematics or science or classics. For here again, what the young student should assimilate is the superior control of thought or expression achieved by great investigators or writers. In short, his position is that of an apprentice striving to learn the trick of the master hand.

We can hardly leave the subject of discipline without some reference to the place of punishment in the school economy. Here the essential point to seize is that the intention of punishment should be positive, not negative; it should aim at helping the backslider to do willingly what he ought to do, rather than at preventing him from doing what is forbidden. Even in the treatment of crime it is now well established—though the fruits of the discovery are sadly slow in maturing—that mere repression is no cure, and that the true remedy lies in re-education and the 'sublimation' of the criminal's misdirected energies (pp. 64-5). Punishment may properly be used as a deterrent against acts, such as unpunctuality and disobedience, that clearly violate the school order which it is the common interest to maintain. But it has no *moral* effect unless approved by the general sense of the community. Disorderly and other mildly anti-social acts are often best punished by mere exclusion of the offender from the common occupation;

the sight of other children happily busy while he is reduced to nauseous inactivity wakens the strongest motive to repentance. This principle does not, however, justify the pernicious practice of 'keeping in' children whose naughtiness is an irritability due to boredom, to insufficient sleep, or lack of fresh air or exercise; to cut such a child off from his play is to withhold the specific remedy for his disease. In proportion as an offence assumes the character of a sin, the deterrent and retributive aspects of punishment should become subordinate to the remedial; it should look not towards the unsatisfactory past, but towards the still hopeful future.¹ One may feel shame when made to see oneself in the unpleasant character in which one appears to others, but a real 'change of heart' comes only as one secures hold on a better way of life. The wise teacher, then, will not be contented merely to repress the symptoms of spiritual sickness, but will try by all possible means to remove its causes. And, as we have seen, those causes generally consist in the disorderly, mal-adjusted working of impulses—attractions and repulsions, conscious and still more frequently unconscious—which by prudent handling may be redirected into the ways of spiritual health.²

To these few observations we add only one general remark. The conviction, once so deeply rooted in the teaching profession, that punishment and the fear of punishment are the natural foundations of school government, is gradually being recognized as merely a barbarous superstition. Every teacher of wide experience now knows that a school in whose atmosphere the thunder clouds of punishment are always brooding may often show no superiority, as regards visible order, over one where punishment is a rarity. Offences must come and must be dealt with, but it is a sound principle to regard them, in general, as signs of mal-adjustment rather than of natural wickedness: that is, to take them as indications that there is something wrong in the curriculum, the methods of instruc-

¹ In the dialogue *Protagoras*, written more than 2,300 years ago, Plato puts this humane and sensible doctrine into the mouth of the famous sophist. (*Prot.*, Ch. XIII, 324 B.)

² Psycho-analysis is by no means an instrument for a layman. Nevertheless, it is to the results of psycho-analysis that we must look to find methods, at once truly scientific and truly humane, of dealing with the moral lapses of young people. Cf. the footnote upon 'child guidance,' p. 66.

tion, or in the physical or spiritual conditions of the child's life at school or at home.

From the general tenor of our argument throughout the book it is clear that while the school must be a society, it must be a society of a special character. It must be a natural society, in the sense that there should be no violent break between the conditions of life within and without it. There should be no cramping or stifling of the citizens' energies, but room for all, whether teachers or taught, to live wholly and vigorously ; no conventional standards of conduct, but only the universal canons and ideals ; no academic separation from the interests of the great world, but at least an intellectual participation in them. On the other hand, a school must be an artificial society in the sense that while it should reflect the outer world truly, it should reflect only what is best and most vital there. A nation's schools, we might say,¹ are an organ of its life, whose special function is to consolidate its spiritual strength, to maintain its historic continuity, to secure its past achievements, to guarantee its future. Through its schools a nation should become conscious of the abiding sources from which the best movements in its life have always drawn their inspiration, should come to share the dreams of its nobler sons, should constantly submit itself to self-criticism, should purge its ideals, should re-inform and redirect its impulses.

The foregoing remarks have a clear bearing upon the 'education for citizenship' which has in recent years been so persuasively advocated. They give no support to any proposal to make this a special branch of school studies, but suggest, on the contrary, that it should be the natural outcome of school activities and discipline, and of teaching truly representative of the subjects taught. To deal with the second point first, most young minds have a lively desire, sometimes reaching the height of a passion, to understand, for instance, how a telephone, a motor-engine, or a wireless set 'works,' how a mariner steers his course across the ocean or an air-pilot finds his way over half a continent, how the modern chemist brings about his miraculous transformations of old and creations of new substances. Inquiries into such matters are not

¹ The statement should be understood as including the universities.

parerga, but, at a certain stage (p. 270), are often the best means of illustrating the true nature of science and mathematics as well as of showing how great a part those kinds of knowledge play in the active life of the contemporary world. Studies in history and geography that show how governments arise and strive to fulfil their purposes, how the gifts of nature are exploited for the maintenance and enrichment of life, and how the peoples succeed—and too often fail—in co-operating for that common interest have a similar psychological sanction and serve the same end of illuminating the practice of the Great Society and of furthering social intelligence.

Next, the ideas and values implicit in the school system of life and discipline tend to become the habitual basis of the scholars' conduct and thus to have a permanent influence upon their moral outlook. Thus, where that system is rightly inspired and organized, it becomes an effective training in good citizenship.¹ But good school citizenship is not identical with good citizenship in the wider world. A smooth passage from the one to the other needs more than intellectual participation in the doings of that world; there must be imaginative sympathy with the aims, labours, responsibilities and sacrifices of the agents. As an important means of awakening such sympathy we refer again to the 'talks' and visits described in the footnote on p. 207, and particularly to what was said on p. 95 about the social activities of sodalities composed of older boys and girls. Through such practices rather than in hortatory addresses upon the duties of a citizen the all-important living touch is most likely to reach the pupil's mind, and to awaken there the spirit of civic duty and service.

The conception of the school as both a natural and an artificial society explains why it is difficult, if not impossible, to give an answer, valid in all circumstances, to some questions of educational policy. For instance, there are many who oppose boarding schools on the ground that they cut boys and girls off from their natural life in the home. But to this objection it may be replied that in a well-conducted boarding school there are a concentration of social life and a heightening of the social temperature which, in their disciplinary effect, more than counterbalance the loss of home influence.

¹ F. C. Happold, *Towards a New Aristocracy* (Faber, 1943), is a study of this aspect of school life.

There is little hope of bringing this dispute to a definite issue. The modern tendency seems on the whole to favour the day school ; but the fine tradition of the historic English boarding schools is by no means moribund, and is, perhaps, destined to give birth to institutions¹ that will greatly enlarge its influence on our national life. Meanwhile there is a healthy tendency for day schools to adapt to their circumstances some of the characteristic features of the boarding schools, and for boarding schools to break from their monastic seclusion and to seek a closer contact with outside interests.

Co-education is an equally intractable question. Co-educators aim, in the first instance, at purifying and strengthening the bases of family life by teaching boys and girls to know one another, and at removing, through constant intercourse under natural conditions, the occasions for unhealthy curiosity and premature sexual excitement. And they also count upon a general beneficial influence of the ideals of each sex upon the character of the other, and upon a certain fusing of their moral traditions. Those who harden their hearts against these ideas lay stress on the natural tendency for adolescent boys and girls to move apart and to develop unhindered their own ways of life.² This tendency, they maintain, is a plain indication that the special virtues of the sexes are, at least in the later years of school, best cultivated where neither sex is distracted by the presence of the other. That co-education in childhood is a sound policy is, however, a view rapidly spreading, and there are few competent judges who do not deprecate anything like conventual segregation in the years of adolescence. In sum, we may say that the question how far free association of the sexes in work and play is deliberately to be limited or encouraged can hardly be decided without a completer collation of the evidence than seems at present available.

The issue takes a different form in the controversy about the

¹ For example, to boarding schools intended, like the Caldecott Community, to give to children of the working classes something of the advantages of public school life. The whole question of day and boarding schools is discussed in Chapter IV of the Fleming Report, *The Public Schools* (H.M.S.O., 1944).

² Cf. Slaughter, *The Adolescent*, p. 28. On the other side, see J. H. Badley, *A Pioneer School* (Methuen, 1923), and B. A. Howard, *The Mixed School* (Univ. of London Press, 1925).

respective merits of a 'general' and a 'vocational' education. The upholders of vocational education are on firm ground when they emphasize the strong desire of the adolescent to lay hold of the realities of life (pp. 96-7), and their opponents are in a correspondingly weak position when they deny that training for a specific occupation can have educational value. In discussing the question we must take care not to cloud the issue by considerations relevant only to the present imperfect state of society and to debate the merits of vocational training upon purely educational grounds. From that standpoint, it is evident that some forms of vocational training are at once excluded from the purview of the school. It is useless to train a boy to be a policeman or a tram-conductor, wrong to train a girl with a view to her making cardboard boxes all her life. But when it is a question of training a future naval officer, a mariner, an engineer, a cabinet-maker, a builder, a farmer, the decision may be very different. Such occupations meet no trivial or transient needs. They have behind them a dignified history and a distinctive moral tradition. They have nursed fine characters and given scope to noble intellects and splendid practical powers. They cannot be worthily carried on without scientific knowledge or artistic culture. To school a boy in the tradition of one of these ancient occupations is to ensure (if it suits his *ingenium*) that he will throw himself into his work with spirit, and with a zeal for mastery that schoolmasters usually look for only in the elect. And it does more. Work which carries a boy directly towards the goal of his choice, work whose obvious usefulness gives him a sense of dignity and power, often unlocks the energies of a mind which a 'general' education would leave stupid and inert.¹ The boy's whole intellectual vitality may

¹ The present writer once had in his form a boy who had been consistently so idle and indifferent that he could not be presented for the University Local examination. While his fellows were taking this, the author, learning that the lad's heart was set upon electrical engineering, took occasion to point out that without mathematics his ambition must remain a dream. Thereupon the lazy boy woke up, begged to be taught 'engineers' mathematics,' and in the few weeks left of his last term at school made astonishing headway in the subject, acquiring, in particular, an excellent grasp of the nature and simplest practical uses of the differential and integral calculus. Cf. the following passage from Rt. Hon. Winston Churchill's autobiography (*My Early Life : A Roving Commission*, p. 73): 'Instead of creeping in at the bottom [at Sandhurst], almost by charity, I passed out with honours

be heightened, his sense of spiritual values quickened. In short, the 'vocational' training may become, in the strictest sense, 'liberal.'

We come, then, to much the same conclusion as before. Vocational education, if conducted in a liberal spirit, is permissible, but cannot be made universal. On the other hand, in its concentration of interest on matters whose social value is evident, in its strong appeal to the practical activities, it contains elements which should, in some form, have a large place in every educational scheme.

Wherever alternative types of schooling are provided for boys and girls leaving the primary schools a further question arises. Are the several courses to be given in a single school, or should there be different types of secondary schools, each with its distinctive curriculum, or group of allied curricula? In the opinion of many, 'secondary education for all' can become a democratic reality only in multilateral or 'omnibus' schools, where pupils of all classes associate on equal terms and no differences are recognized except differences in ability and type of mind. In such schools, they point out, there is a further great advantage that the lines of division between the 'sides' need never be hard and fast, so that any error in the allocation of a child can be readily corrected as soon as his special gifts or weaknesses have become clear. Thus the multilateral school makes both for social unity and for educational efficiency. But there are sceptics who suggest that the omnibus school offers only in appearance a democratic solution of the problem; for a truly democratic system would be closely adapted to the widely varying needs of children—and that is a demand which no composite institution could satisfy. Any attempt to make it do so must, they say, tend to confuse its aims and to depress its activities towards a featureless mediocrity. And they quote critics of repute¹ to show that this result has not been wholly avoided

eighth in my batch of 150. I mention this because it shows that I could learn quickly enough the things that mattered to me.' Many further illustrations are provided by the success of the pre-service organizations, particularly the Air Training Corps.

¹ See I. L. Kandel, article on 'The Multilateral School' in *Journ. of Education* for February, 1943; also the same author's book, *The End of an Era* (1943), pp. 289 *et seq.*

even in the high schools of the United States, where the system has long been in operation and all conditions seemed to favour it. This is because in an omnibus school the ablest pupils are bound either to strike the distinctive note or else to suffer from insufficient stimulus and direction of their powers. In the latter case the interests of individuals and of the community would both suffer; and in the former case serious injustice would be done to many whose capacities are least likely to be fostered in a *milieu* where intellectual achievement is the approved goal of effort and inability to reach it is failure. These pupils need a self-contained world, with values and opportunities of its own, where the least academically minded may find interests and occupations that will develop their powers and give zest to life. In a word, it should be a school where the needs of such boys and girls are the special study and care of teachers who understand and sympathize with them. Similarly it is urged that pupils with a strong technical bent can be taught adequately only in a school with a kindred atmosphere under a direction informed by relevant experience.

As an alternative to a tripartite system it has been suggested¹ that two kinds of secondary schools would suffice, one for the bookish type of pupils and the other for a more practical type, both catering for a very wide range of ability. This plan stresses the indubitable fact that schools provided specially for children of the lower ranges of ability are bound to be unpopular, and assumes that, in fact, they would not be needed. In short, it does not accept the arguments for such schools quoted above.

Experience may show that in the wide-ranging social conditions of a great country all these solutions of the problem will have a place. The allied questions about the length of the several post-primary courses are less controversial, and have in effect been settled for England and Wales by the Act of 1944. The grammar schools of the old tradition (including the public schools) have long provided courses, often of high intellectual quality, that lead directly to the universities and other places of higher education, technical or professional. In the past these have been of incalculable service to the community, and to allow them to decay or to

¹ In a report adopted by the Education Committee of the London County Council, January 1, 1944.

admit a lowering of their standards would be a deplorable policy. Such courses must, then, continue to engage the best pupils of the grammar schools until the age of 18, when their obligations under the Act come to an end. But they must also be made more easily and more fully accessible to the intellectual élite of the nation, no matter how restricted family circumstances may be, however humble the social station; and it may be added that, without ceasing to inculcate the scholarly virtues or neglecting the cultural graces, they should bring their curricula into closer accord with the spirit and needs of the contemporary world. Of the other secondary school courses some will be of a literary or scientific type less advanced and exacting than the foregoing; some will have a definite technical outlook or 'bias'; and there will be probably a miscellany of courses based upon the new practical and cultural curricula that were beginning to appear in the 'reorganized' senior schools under the old régime. These will retain their pupils until the age of 16—after a transitional period during which the leaving age may be 15. But though full-time school attendance ceases to be compulsory after that age, an important phase of the pupils' education is still to come. We have seen (p. 125) that the common purpose of all types of secondary education is to guide their pupils safely and usefully through the years of adolescence. That aim may be taken to imply that, throughout this period, they should remain under the formative influences of some society organized to foster their development as human beings. In conformity with this idea it is enacted that 'it shall be the duty of every local authority to establish and maintain county colleges, that is to say, centres approved by the Minister for providing for young persons who are not in full time attendance at any school or other educational institution such further education, including physical, practical and vocational training, as will enable them to develop their various aptitudes and capacities and will prepare them for the responsibilities of citizenship.' In other words, the scheme shall be framed with a view to the needs of the 'whole man' and it will find an appropriate place for the activities considered on pp. 96 and 207.

We come now to the last of our problems: the problem of the

curriculum. Upon what principles are we to decide what is to be taught and the spirit of the teaching?

The most obvious criterion is that of usefulness. While the plain man generally likes his children to pick up some scraps of useless learning for purely decorative purposes, he requires, on the whole, that they shall be taught what will be useful to them in after-life, and he is inclined to give 'useful' a rather strict interpretation. Let us beware of despising his view; for at bottom it is thoroughly sound. If he could think his thoughts out clearly, he would often be found to be not an enemy of culture, properly understood, but only of the academic folly that cuts culture off from its roots in common life. He is right in thinking that this tendency—the besetting temptation of the schoolmaster in all ages—does untold harm. The man who would expel the ancient classics from our schools is a less dangerous Philistine than the man who treats their pages chiefly as material for 'mental gymnastic';¹ nor is his modern rival, the teacher of science, always guiltless of what is, at bottom, the same sin.² Thus lay criticism, even when imperfectly informed, is valuable if only because it constantly brings us back to the true function of the school in relation to society (p. 253), and challenges us to examine the relevance of our teaching to the needs of life.

The criterion of usefulness is, however, not always easy to apply. Take mathematics—a subject in whose usefulness the average parent has complete faith. There is no doubt that a certain power of handling figures is a very desirable accomplishment; any person

¹ 'The trade in classic niceties,
The dangerous craft, of culling term and phrase
From languages that want the living voice
To carry meaning to the natural heart;
To tell us what is passion, what is truth,
What reason, what simplicity and sense.'

WORDSWORTH: *Prelude*, Bk. VI.

The whole poem is an invaluable document for the theory of education for individuality.

² Cf. *The New Teaching*, Ch. V. A brilliant student once informed the author that while at school she never conceived science as having reference to anything that happens outside a laboratory! For her it was merely one of the things you have to 'do' for an examination.

is likely often to be embarrassed if he cannot cast accounts, determine his profits and losses, and check his change. But it is difficult to show that the majority of people will ever need much more mathematical skill than this. How then are we to justify the universal study of the abstruser parts of arithmetic, to say nothing of the geometry and algebra that are 'useful' only in certain professions? Nonplussed by this difficulty, the plain man will generally admit that, though some kinds of learning may not be directly useful in life, they may be indirectly useful in as much as they give valuable 'mental training.' But that position once conceded, the schoolmaster has licence to indulge to the full his inveterate penchant for formalism. He may teach uninterested boys to construe Latin, because although they will forget the Latin at the earliest opportunity, they will have acquired 'exactness of thought' and the priceless power of conquering difficulties; he may make them spend weary hours in 'simplifying' formidable algebraic expressions, because in that way one gains 'accuracy of mind'; in short, he will claim the right to continue doing all the things that seem so unreasonable to the unenlightened outsider.

Here is the famous doctrine of 'formal training,' which asserts that facility acquired in any particular form of intellectual exercise produces a general competence in all exercises that involve the same 'faculty.' Its paradoxes were exposed by Sir John Adams in a *reductio ad absurdum* that will always be one of the most delightful passages in pedagogic literature;¹ and its truth has been tested—and found wanting—in many instances where it could be tried at the bar of exact experiment.² Yet it is difficult to suppose that there is no truth in a view which holds so firm a grip upon teachers and has seemed unquestionable to many acutely observant minds. In what, then, does its truth consist?

Our study of discipline (p. 250) suggests an answer. A subject such as mathematics represents a tradition of intellectual activity that has for centuries been directed towards a special class of objects and problems. In generation after generation men, some-

¹ *The Herbartian Psychology applied to Education*, Ch. V.

² The Spens Report (1938) contains two valuable memoranda (Appendices IV and V) on the historical and cognitive aspects of the doctrine—the former by Cyril Burt, the latter by H. R. Hamley.

times of outstanding genius, have studied those objects and worked at those problems ; accepting, correcting, expanding the methods and knowledge of their predecessors and handing on the results of their own labours to be treated in the same way. There has grown up thus a distinctive type of intellectual activity, exhibiting a well-marked individuality, and informed by a characteristic spirit and *ethos*. The student who is thoroughly schooled in the subject will make this spirit his own ; the ideas, the mental habits and the kind of intellectual integrity proper to it will become ingrained in his nature, and he will tend to bring them into play wherever they can be applied. A lawyer, for instance, will reveal his legal training in treating any question of general rules or the estimation of evidence, however remote it may be from his professional interests—as William Harvey the physician said of the great Bacon, a Lord Chancellor will write on philosophy like a Lord Chancellor. So a modern chemist may be heard to complain of a fellow-investigator, trained in the sister-science, that he attacks chemical problems like a physicist.¹

The history of thought constantly exemplifies the same principle. For example, Newton, preoccupied by ideas of gravitational attraction, carried the 'astronomical view of Nature' into all departments of his scientific studies, and so laid the foundations of modern molecular physics and atomic chemistry. And not only so ; it is not extravagant to say that the thinkers of the eighteenth century, schooled in the Newtonian ideas, dealt in what we may call the astronomical spirit even with political and social problems ; just as their successors, schooled in Darwinism, have dealt with them in terms of the biological notion of evolution through natural selection.²

We conclude, then, that the training produced by an occupation or a study consists primarily in a facility in applying certain ideas and methods to situations of a certain kind, and in a strong tendency

¹ G. K. Chesterton has somewhere giped at the man who would decide the question of human immortality from the standpoint of an electrical engineer. But can an electrical engineer do otherwise ? We can none of us escape from the habitudes and outlook that belong to our training. That is why men must differ in opinion to the end of time, and why large ranges of truth will always be inaccessible to each of us.

² B. Branford points out what loss our national life has suffered through the modern degradation of agriculture, which has deprived it of one of the most valuable sources of trained intellect and judgment.

to bring the same ideas and methods to bear upon any situations felt to be akin to these. If to this statement be added what we have said about the permanence of the qualities generated in a sentiment (p. 187), the reader will have before him practically all the facts about 'mental training' that will stand examination.¹

Our view of the curriculum now shapes itself as follows. The school must be thought of primarily not as a place where certain knowledge is learnt, but as a place where the young are disciplined in certain forms of activity—namely, those that are of greatest and most permanent significance in the wider world. They fall naturally into two groups. In the first we place the activities that safeguard the conditions and maintain the standard of individual and social life: such as the care of health and bodily grace, manners, social organization, morals, religion; in the second, the typical creative activities that constitute, so to speak, the solid tissue of civilization. The latter can be easily identified. What a loss civilization would suffer if all that the words 'art' and 'science' stand for were obliterated! What a poor thing it would be if the poet ceased to dream and sing, if there were none to 'handle the harp and pipe,' if the hand of the craftsman forgot its cunning!

In the school curriculum all these activities should be represented—simply and informally in the more elementary types of schooling, more fully and formally in the more advanced types. For these are the grand expressions of the human spirit, the forms which the creative energies of every generation must accept and develop if the movement of civilization is to be worthily maintained even upon its humbler levels. Taking the second group first, every complete scheme of education must comprise (i) literature, including at least the best literature of the mother-land; (ii) some forms of art, including music, the most universal of the arts; ² (iii) handicraft, taught with emphasis either on its æsthetic aspect, as in weaving,

¹ F. A. Cavenagh, 'The Disciplinary Value of School Subjects' (*The Forum of Education*, November, 1925), stresses the importance of building up strong sentiments whose more important features may be carried over, consciously or unconsciously, from one subject or kind of situation to others.

² The inferior place now given to art is one of the gravest defects of the curriculum, especially in secondary schools.

carving, lettering, or on its constructional aspect, as in carpentry and needlework; (iv) science, including mathematics, the science of number, space and time. History and geography should appear in it in a double guise. On the one hand, history belongs with literature as geography belongs with science. On the other hand, they should have a central position in the curriculum as the subjects in which the human movement is, as such, presented and interpreted: history teaching the solidarity of the present with the past, geography the dependence of man's life upon his natural environment, and the interdependence of human activities all over the globe.¹

The activities of the first group cannot, from their nature, be treated as 'subjects,' though they should be inspired and nourished by the pupil's studies and must to a varying extent be guided by definite teaching. Physical health and bodily grace, for instance, cannot be taught as French is taught, though, as regards health, the pupil should gain hygienic ideals and knowledge in his science lessons, and, as regards bodily grace, there may be lessons in 'eurhythmics,' in addition to the training of voice, gesture and carriage which will be gained in the dramatic and oratorical exercises that will form part of his literary studies. Similarly, the pupil will learn the ideals of government and social organization in the exercise of his duties as a citizen of the school society, though his lessons in history should here have much direct and indirect influence.

Of religion substantially the same things must be affirmed. Few will dispute the assertion that no department of school activity is in a more unsatisfactory state than 'religious training.' It would be unjust to charge upon the schools a fault in which they simply reflect the confusion and bewilderment that weaken the spiritual energies of all the civilized peoples. There is, however, no hope of remedying the disaster until the character and history of religion as a natural activity of the human spirit have been properly analysed,

¹ Cf. J. Fairgrieve, *Geography and World Power*, pp. 343-4 (Univ. of London Press, new ed., 1919). The cultivation of language, with the dependent arts of reading and writing, is not mentioned specifically in our list, because, although it must have its separate lessons, it is so fundamental as to be involved in practically all the activities of both groups.

and a teaching procedure based on that analysis has been worked out and courageously applied.

It would be arrogant to offer here more than a few tentative remarks upon so tremendous a theme. In religion there are two things to be distinguished. One we may call the religious spirit; the other is theology, which is a theory of the objects that evoke the religious spirit. No man in whom the religious spirit stirs can altogether avoid a theology. Atheism itself may sometimes be a religious theory—one that excludes God, because, like Laplace's cosmogony, it finds no need for that hypothesis. The essential marks of the religious spirit are the recognition that there are objects of supreme and universal worth which rightly claim our reverence and service, together with a sense that, though in our weakness and unworthiness we must ever be their 'unprofitable servants,' yet to deny their claims or to fail in loyalty to them is shameful and dishonouring. Thus a man may reveal the religious spirit in devotion to truth or to art, or in the loving service of his fellows; such devotion and service being felt, as we have said, as a Divine charge which he may not refuse, though its form, varying with the form of one's individuality, need not be the same for him as for another (p. 249).

The religious spirit, like all large movements of our nature, inevitably takes on a social character. Men who serve the same ideals will come together to share the warmth of their devotion or to confirm their faith, to preach or to hear their gospel and to create the corporate strength without which it cannot hold its own in a hostile or indifferent world. Thus the religious spirit will always have its church; and where there is a church there will surely grow up a ritual—that is, some form of routine charged with spiritual symbolism (p. 75). It may be that these things are (as A. N. Whitehead insists)¹ only 'the trappings of religion, its passing forms,' and that religion in its origin arises from 'the awful ultimate fact, which is the human being, consciously alone with itself'—in a word, that 'religion is what the individual does with his solitariness.' Nevertheless the creeds that distinguish one religion from another and (to quote Whitehead again) 'have the effect of transforming character when they are sincerely held and vividly

¹ In *Religion in the Making* (Cambridge Univ. Press, 1926), pp. 13-17.

apprehended ' are plainly, in their developed forms, social products, however much they may owe to the insight of spiritual genius.

Of school studies, literature is from the present standpoint the most important ; for

books which lay

Their sure foundations in the heart of man

have more power than anything, except the contagion of a noble character, to heighten the sense of life and of its values. It is for this reason deplorable that the reverence that set the Bible apart as a book by itself has largely defeated its own aim. In the interests of religious training nothing is more desirable than that the Bible should be removed from its unnatural isolation, and restored to the company of books read and loved for their own sake. And if we should not for ever treat Bible poetry and story merely as occasions for moral disquisition or theological interpretation, but should let it deliver its own witness, quietly, to man's spiritual experience, so, when we desire to appeal specifically to that experience, we do unwisely to confine attention to its pages. There are many fervent Christians who count the dialogues of Plato among the documents of their faith.¹

Upon the ritual aspect of school religion we can say here nothing more than is contained or suggested in a previous chapter (Ch. VI). The standing danger with regard to school ' services ' is the one to which Wordsworth refers so scathingly in his lines upon compulsory college chapel :

Was ever known
The witless shepherd who persists to drive
A flock that thirsts not to a pool disliked ?

and it can be avoided only by courageous and candid study of the actual spiritual needs of young people of different ages.²

¹ A headmaster friend once told the author that one of his prefects had recently chosen as the ' lesson ' for the day a passage from the Phædo which he was at the time reading in class. Such an incident illustrates well the natural catholicity of the adolescent, as well as his sensitiveness to the spiritual value of literature.

² The case for compulsion is candidly stated in C. Norwood, *The English Tradition in Education*, Ch. III. It is laid down in the Education Act of

As we come to what we have called theology, we approach by far the most difficult problem, the one with which it is least possible to deal profitably. There are here two hopelessly discordant policies. One is the policy of those who hold that a school should draw its whole life from some historic religious society with its centuries of experience and its traditional creed and ritual; the other, of those who would leave the duty of giving definite shape to children's ideas about the source of the Divine to the churches and home teaching. These conflicting views and the several compromises between them we must leave as they are.¹ We must, however, insist that success here, as elsewhere in education, can be hoped for only if the concepts offered to young people are adjusted to their actual experience and state of development (p. 197). Neglect of this principle must often set up complexes which will later reveal themselves in the form of hostility to all religious ideas—a phenomenon with which those who have the confidence of adolescents are familiar.

All branches of the curriculum are, we have said, to be taught as *activities*. This implies that all will have both a practical and an intellectual aspect. In art and handicraft the practical side is the more obvious; but learning to recognize and enjoy good music, pictures and architecture, and to value craftsmanship in wood and metal, beauty in needlework and woven tissues, grace in simple

1944 that in every school in receipt of grant 'the school day shall begin with collective worship on the part of all pupils,' and that 'religious instruction shall be given'—subject to the usual conscience clause.

¹ There is a third policy whose advocates are beginning to be heard. Standing upon the sound principle that religion must be dealt with in school in the same way as any other of the cardinal traditions of civilized life, the upholders of this policy (which does not exclude the first one mentioned in the text) would give 'dogmatic teaching,' not in the sense of laying down theological propositions to be accepted without argument, but with the view of explaining the meaning of the great Christian dogmas, their relation to experience and philosophic reflection, and (presumably) something of the circumstances in which they were formulated. The recipients of the instruction would still be left, as in comparable instances in other subjects, to determine their own attitude towards the dogmas expounded, but would at least have a clear knowledge of their significance. It was in this spirit that James Mill taught his son ecclesiastical history.

clothing is equally important. Under science we place nature-study rambles, 'pond-dipping,' the care of the school aquarium, the school garden and weather records, as well as the usual laboratory work; under mathematics come 'boy scout geometry' for younger pupils and, for the experts, physical determinations that draw upon higher ranges of the subject (*cf.* p. 207). The practical side of literature will naturally include home-made verses, stories and essays for the school magazine, play-making and play-acting. Geography, in alliance with mathematics, should have its simple programme of surveying and map-making, and play a part in exploring local history. In short, the aim must be to let every branch reflect truly the essential characters of the creative tradition it represents in the simplified world of school life.¹

Where this is done the subjects will naturally be unfolded in stages showing a community of character, and analogous to stages in their historical development. As an illustration of that important principle we will take the history of magnetism and electricity; for the successive phases are here clearly marked and everybody knows something about them. In the first stage the discovery of famous 'marvels of science' was the predominant feature: *e.g.*, the mysterious powers of the lodestone, the electrical machine with its mimic lightning, Galvani's frogs' legs set twitching by metallic contacts, Oerstedt's deflection of the magnetic needle by an electric current. Here the attraction and the lure to further inquiry lay in the novelty and surprising character of the things brought to light. Remembering one of Plato's best-known sayings, we may call this first phase the 'wonder-stage.' In the next phase the sciences, becoming sophisticated, were drawn into the service of man; they produced the electric telegraph, the telephone, the dynamo and

¹ For example, in teaching science the aim should be 'to make our pupils feel, so far as they may, what it is to be, so to speak, inside the skin of the man of science, experiencing not only something of his labours, but also something of his sense of joyous intellectual adventure.' (Quoted from T. P. Nunn in Adams, *The New Teaching*.) The passage has been criticized in the reaction against 'too much practical work'; but the author holds that if school science is to be the science of scientists *some* place must be found for the principle it expresses. A parallel dictum that 'school geography should be the geography of geographers' does not seem to have been challenged.

motor, electric lighting and transport and many other utilities. It is natural, therefore, to speak of it as the 'utility-stage.' Lastly came the 'system-stage,' i.e., the search for a comprehensive theory providing a place and an explanation for all electro-magnetic processes—a search that culminated about 1870 in the great work of Clerk Maxwell and initiated a similar three-phase sequence beginning with Hertz's epoch-making discovery of electro-magnetic waves.¹ Turning to history as a typical 'humanistic' subject, it needs little ingenuity to find there an analogous sequence, moving from the primitive phase of saga and legend to the synoptic and philosophic studies of modern historians. In the æsthetic field it has also been detected in the evolution of pattern-design from its paleolithic beginnings onwards.²

The rhythm thus discernible in many cultural traditions comes out still more clearly in our pupils' reactions to them. Interest in the strange, the wonderful and the intrinsically delightful is, indeed, the starting point of most of their intellectual adventures, the earliest spur to thought and inquiry. The success of a good course in Nature study is due to its skilful exploitation, the dullness of much mathematical teaching to its neglect. It can never be entirely ignored in teaching young children, but its value at the secondary school level is not always recognized. For, while the three motives, wonder, utility, perfection of system, tend to give their colour in succession to phases in the curriculum as a whole as well as to its minor sections, yet none should be wholly absent at any stage. Even young children can see the usefulness of much that they are taught, and find pleasure in tracing those connections and resemblances between things that are the beginning of system. Again, although the middle years of the course are predominantly the utility-stage, and the system-stage is fully developed, if at all, only

¹ The reader will see that the history of the X-rays and the developments that followed the discovery of electrons and of radium give short-range instances of the formula: 'wonder—utility—system.' It seems possible that some great inventions (e.g., the winning of metals from their ores) may have begun in wonder or 'fun' before their useful possibilities were seen. Modern mechanical engineering has reached a well-marked system-stage.

² See A. H. Christie, *Pattern Designing* (Clar. Press, 1929). As an exercise the reader may inquire how far it applies to literature and the arts of speech.

at the highest school level, yet the studies even of the most mature pupils should occasionally open up avenues rich in novelty and seductive charm.¹

The most serious fault in the traditional teaching in secondary schools has been premature concentration upon the system-stage and consequent neglect of the earlier stages. As we have already remarked (pp. 253-4), curiosity about the practical concerns of the great world is at this age always keen and may amount to a passion. It should be exploited systematically and often be made the basis of one's teaching method. That shrewd practical philosopher, William Cobbett, who despised the schools of his time, taught his own children upon this principle—anticipating by a century the modern 'project-method.' He let them see that the rural holding they were all interested in could not be worked successfully without the advice of a gardening book—which his eldest boy was led to read 'perhaps twenty times over'—or, again, without some knowledge of arithmetic. Impelled thus by the utility motive, a child, he remarked, might quickly learn more than the school would teach him in a year.² In mathematics and science, in geography and history, there is abundant scope for what is essentially Cobbett's method—the method that first faces a practical problem and then seeks the principles or the knowledge needed to solve it. Thus an inquiry into the way an electric bell works leads at once to the central principles of electro-magnetism; to understand how a mariner or an air-pilot computes his 'dead reckoning,' one may make acquaintance with sines and cosines; and so on. During the great war many a non-combatant must for the first time have perceived the practical value of geography as he followed anxiously the flow of munitions from Britain to Archangel or the Caspian Sea, and of history as he sought to understand the political difficulties between Poland and the Soviet Union; and he may well have felt that this is the kind of teaching

¹ The author first worked out the formula 'wonder—utility—system' in an address published in 1905. He developed it on the philosophical side in a paper in the *Proc. of the Aristotelian Soc.*, 1907-8, and has applied it mainly to the teaching of science and mathematics in *The Practice of Instruction* (ed. Adamson, 1907), *The New Teaching* (ed. Adams, 1918) and other publications.

² W. Cobbett, *Advice to Young Men* (1830). For apposite contemporary examples, see H. C. Dent, *Education in Transition*, pp. 155 et seq.

he would wish his children to receive at school. In the arts and crafts the principle of utility, though so easy to apply, is not always followed with enough conviction. Not every school can—as some have done—decorate its chapel with panels or its hall with wall paintings, or build and light its own stage; but more modest enterprises in the same spirit are possible everywhere, and would everywhere raise the teaching of the subject to a high level of vitality and efficiency.

Untimely use of the system-principle justifies more than anything else the complaint that the grammar school curriculum is 'academic.' Nevertheless the principle has its essential place, and the present reaction against it (particularly in mathematics, where it has done most harm) may easily go too far. Abstract thought and general ideas have influenced profoundly the shaping of civilization, and it would be deplorable if they disappeared from education or were relegated to an inferior place in it. Systematic geometry and the greater generalizations of science are the traditional ground upon which most pupils have met them, but 'social studies,' if handled with sufficient breadth, give better opportunities for the dialectical discussions that (as Socrates showed ages ago) open up to eager young minds vistas of general truths having deep significance for man's welfare.¹

It is of interest to observe that Whitehead has formulated² independently a rhythmic law similar to our own. In his formula 'romance' occupies the place of 'wonder,' and 'generalization' is the last phase, corresponding to 'system,' while the intermediate phase is the stage of 'precision.' When one considers that no principle can be usefully applied until the exact laws of its operations are known, it becomes clear that 'precision' and 'utility' are but different names for the same phase in the rhythm.

It may be added here that although we have been obliged in a brief review to speak of school activities under their ordinary names as 'subjects,' it does not necessarily follow that the traditional custom of departmentalizing instruction is to be wholly approved. It has no place at all in the nursery school, and in the infants' school

¹ For useful examples see B. A. Howard, *The Proper Study of Mankind*.

² In *The Aims of Education* (Williams & Norgate, 1929); originally published in 1922 as a pamphlet, *The Rhythm of Education*.

should hardly extend beyond the '3 R's'—a region where drill is needed to ensure mastery of the fundamental tools of learning. There is much to be said for the view that in the junior as well as the infants' school much knowledge should gather naturally round objects and 'centres of interest'—as it does when children ply an informative father or a Reverend Mr. Barlow with questions—rather than that it should be pursued along the separate lines of the conventional school syllabus.¹ On the other hand, it seems appropriate that in the later years, as the 'system stage' approaches, the pupil should consciously follow the main logical paths through the world of school learning. Even here, however, the scheme set out on pp. 263–4 should be treated as only indicating the range of activities to be represented in a secondary school, not as prescribing separate lines to be followed by all pupils alike or by any pupil all the time. Subjects may be grouped (*e.g.*, history with geography, mathematics with physics) whenever a particular region of inquiry would gain by the joint illumination. Again, in some departments (*e.g.*, mathematics and science) alternative courses may be given which bring out the essential features of the subject unencumbered by the detail and full technique that make the normal treatment a burden to weaker brethren.² But in every case the teaching, whether elementary or advanced, an outline or a full picture, should not fail to represent the subject justly as a mode of creative activity, and an aspect of the essential spirit of civilization.³

It would be out of place to follow these ideas into their closer applications. There is, however, a last general question which must not be set aside. The school, as we have pictured it, is a select environment where the creative energies of youth may work towards individuality under the best conditions. Does that conception imply

¹ See the *Report on the Primary School*, pars. 83, 84; and for examples, *Curriculum Making in an Elementary School* (Ginn, 1927).

² Cf. *Spens Report*, p. 158.

³ Giovanni Gentile may seem a little 'precious' when he insists that a child's earliest lessons in reading must be given in the true spirit of literary culture; but French primary school teachers, who are bidden to regard themselves, first and foremost, as 'missionaries of the French language,' have before them an ideal that can hardly be too highly valued or too widely adopted.

that every pupil shall be free to take from it or to ignore whatever he pleases? If so, would not education be reduced to an anarchy offensive to common sense, corruptive rather than formative of character? If not, does not the principle we have so persistently asserted turn out to be but a high-sounding phrase?

Happily for our comfort, we need accept neither horn of this alarming dilemma. Of a child it can generally be said with more truth than of any man, *humani nil a se alienum putat*. A normal child's appetite is as varied as it is vigorous, and he can rarely resist the impulse to emulate another's exploits. Thus it is not often difficult to make him take his intellectual meals, provided the fare is properly chosen and attractively set out. This remark applies especially to reading, writing and simple cyphering—things in which the modern world imposes such penalties for incompetence that every child must master them. Their intrinsic attractions may not make a strong appeal to all, but are much enhanced by intelligent teaching; and there are no subjects in which the utility motive can be evolved so readily and so early in life. As the child grows older, more normalizing factors come into play: shame at ignorance or inferiority, zeal for the honour of his form or house, a sense of duty, a desire to please his teachers and a readiness to accept their point of view, and on top of these, the tendency to do the accepted thing because it is accepted. Still later, at the age when, under the existing order, specialization is held to be desirable, caprice is checked partly by the pupil's knowledge that certain subjects, some perhaps distasteful, are necessary ingredients in his professional studies, partly by his discovery that the subjects nearest to his heart cannot be pursued far without the help of others—as a student of history or science finds that he cannot get on without some grinding at foreign languages.

The reader may, however, press the case of a pupil who withstands the social forces tending to drive him to naturally distasteful studies. Is he to be allowed to leave school ignorant of an essential subject simply because he chances never to have felt its attraction? It would be fair to counter this question with another. Does the disaster here contemplated never happen under the present system? Do we really succeed in forcing unwilling students to assimilate what we think they ought to know? But the *tu quoque* argument gener-

ally covers an attempt to evade an issue. Let us face the issue and admit that in our ideal school the ultimate veto lies with the pupil—though it is never to be exercised lightly or without a genuine trial of the repellent subject. There are considerations that will make this state of affairs seem less scandalous than it at first appears. A pupil who resists the appeal of a subject has often been known to turn to it later with great zeal, and soon to make up the headway he had lost. If, however, the resistance persists to the end, it is better to cut the loss rather than to do violence to the pupil's nature.¹ After all, if we once admit that minds of varying types have an equal right to exist, we shall be ready to see that the interests of a boy or a girl are rarely so erratic as not to offer the basis of a synthesis of studies that will perform all the essential functions of an education.² Moreover, though it may seem to a teacher deplorable that a pupil should leave school with wisdom at one of her main entrances quite shut out, this feeling expresses a professional prejudice rather than the judgment of the greater world. The world, indeed, is widely tolerant of ignorance in most matters, provided it is balanced by competence in others. And here we must always remember two highly significant facts: first, that rebels against the Procrustean tactics of the schoolmaster have, in numberless instances, proved surprisingly competent in after-life; and, secondly, that most of these, including some who have placed the world deeply in their debt, so far from repenting of their youthful intransigence, have continued to be the severest critics of the system against which their inarticulate protests were once raised in vain.

It is in any case obvious that, since children differ widely in native ability, special gifts and inclinations, no single educational régime can meet the needs of all; however brilliant or however humble a mode of individuality may be, its full-rounded development is to be

¹ At least one headmaster of an important public school has advocated letting a boy drop the study of all languages but his own if he shows a persistent distaste for them.

² This seems, in effect, to be the view adopted in the official Report on the Curriculum and Examinations in Secondary Schools (the *Norwood Report*, published by H.M. Stationery Office, 1943). In accordance with it the Committee recommended (p. 47) that, in the School Certificate Examination, pupils should be allowed to present whatever subjects they wished.

looked for only in an educational medium friendly to it. For that reason an enlightened community will, as we have seen (pp. 258-9), provide for its young population alternative types of schooling, especially of secondary schooling, varied in standard and pattern. Every child may then find his way to the type best suited to his nature and needs, and 'educational opportunity' will be as equal as it can be made in an imperfect world. The striking reforms recently adopted in England and Wales clearly have this happy state of things as their goal; but it would be optimistic indeed to expect the goal to be easily or quickly reached. Any new system was bound to be in the main a reshaping of the old one. But the old system was in its origins based unashamedly upon the social divisions that, in Disraeli's phrase, made us two nations; and here is a *damnosa hereditas* whose results will be worked out of the new system only as the 'two nations,' already unified in national feeling and democratic outlook, become one in language, essential culture and harmony of interests. Until then the ideal educational system will continue to be best exemplified in Utopia, where teachers are all men and women of character and genius, where administrative difficulties scarcely exist, where the diagnosis of children's potential powers is infallible, and where schools are organs of a society uncorrupted by sectional privileges and unfettered by sectional prejudices. The fact is, however, irrelevant to the value of our argument; for it is the proper function of an ideal to point beyond the range of present possibility. The only question really relevant is whether it points in the right direction. That question must be left to the judgment of the reader, who will decide whether we have justified the position outlined in the first chapter, and shown to be firmly based upon the nature and needs of man and society.



We stand at an hour when the civilization that bred us, having barely missed uttermost disaster, faces a future which no one pretends to read. It cherishes bright hopes but knows too well that they may be dupes; is haunted by fears and is far from sure that they may be liars. It is faced by problems which we cannot hope ourselves to solve; they must be solved, if at all, by the

generations that will take up our work when our place knows us no more. Thus the questions we have debated in this book are of no mere academic interest. They concern all who would fain believe that men are not wholly the sport of circumstance or the puppets of fate, but that their own wills shape the decrees which determine, slowly yet inevitably, 'the doubtful doom of humankind.' To all such it must be important to be assured that though our children cannot build a fairer world on any other foundation than our own, yet they are not bound, unless in our folly we will have it so, to repeat for ever our failures; that they have in them a creative power which, if wisely encouraged and tolerantly guided, may so remould our best that, as the dark shadows pass, 'the life of the world may move forward into broad, sunny uplands' and become worthier than any we have yet seen.

NOTES ON BOOKS, ETC.

The historical memoranda contributed by R. F. YOUNG to the reports of the Consultative Committee of the Board of Education have permanent value—especially those upon the secondary school curriculum in the *Spens Report* (1938). The doctrine sketched on pp. 263-4 is closely similar to that given in B. BRANFORD, *Janus and Vesta* (Chatto & Windus, 1916), a work full of profound reflections on educational questions. JOHN DEWEY's works (especially *The School and Society* and *Schools of To-morrow*) should be known to all students. *Education for Citizenship in Secondary Schools* (Oxford Univ. Press, 1936), issued under the auspices of the Association for Education in Citizenship, is a comprehensive review containing many suggestive essays by an authoritative team of authors. For the relations between education and national life, see T. P. NUNN, 'The Education of the People' in *The Advancement of Science* (John Murray, 1923), H. BOMPAS SMITH, *The Nation's Schools* (Longmans, 1927), and CYRIL NORWOOD, *The English Tradition of Education* (John Murray, 1929). The Educational Year Book of the International Institute for 1928 (Teacher's College, Columbia University, 1929) contains authoritative accounts of vocational education in England, France, Germany and U.S.A. On religious instruction, see E. T. CAMPAGNAC, *Converging Paths and Religion and Religious Training* (Cambridge Univ. Press, 1916 and 1918), and T. RAYMONT, *The Use of the Bible in the Education of the Young* (Longmans, 1911).

INDEX

- Ability, tests of, 118 *et seq.*; theories of, 129 *et seq.*
 Abstraction, nature of, 221-2
 ACH, N., on types of will, 217, 219
 ADAMS, Sir J., 17, 40, 178, 227, 261, 268
 ADAMSON, Sir J. E., 17
 Adolescence, 66, 197 *et seq.*
 Adolescent, education of the, 125, 188, 259
 Aesthetic activity, 89, 243
 ALEXANDER, S., 37, 51, 172, 241, 243, 246
 ALINGTON, C. A., 231
 American Army tests, 120
 Amœba, behaviour of, 23
 Analytico-synthetic process, 216, 224 *et seq.*, 236, 239-40
 Anamnesis, 48
 Animals, childhood of, 170
 Animism (in children), 192
 Apes, mentality of, 234
 APPLETON, R. B., 72
 Apprehension of experience, 235
 Archetypes, 223
 ARISTOTLE, 9, 241
 ARMSTRONG, H. E., 102
 Art of thought, 52
 Association, types of, 52, 55
 AURELIUS, MARCUS, 25
 AUSTEN, JANE, 56
 Automatic processes, 37
 Autonomic nervous system, 211, 219
 Autonomy of life, 19
 AVELING, F., 223
 Axon (of neurone), 209

 Backwardness, measurement of, 118
 BADEN-POWELL, Lord, 112, 194
 BADLEY, J. H., 255
 BALDWIN, J. M., 203
 BALLARD, P. B., 54, 128
 BARKER, Sir E., 17
 Barnardo Homes, 116
 BARRIE, J. M., 74
 BAZELEY, E. T., 112
 Beauty, theory of, 89, 241 *et seq.*
 Behaviourism, 29, 31, 171, 206
 BERGSON, H., 28, 47, 49, 170, 196; on morality, 244; on religion, 245
 Bible, use of the, 266
 BINET, A., mental tests, 118 *et seq.*, 128; on suggestibility, 162
 Body-mind, 25
 BOOK, W. F., on typewriting, 213
 BOSANQUET, B., 15, 19, 31
 Boy Scouts, 47, 94, 95, 112, 194
 BOYD, W., 111
 BRADLEY, F. H., 87, 206
 BRANFORD, B., 262, 276
 BRIDGES, R., 17, 33, 244, 246
 British War Office Tests, 120
 BROWNING, R., 240
 BURNS, C. D., 78
 BURT, C., 61, 65, 120, 121, 122, 126, 128, 134, 139, 142, 144 *et seq.*, 152, 188, 203, 205, 261
 BUTLER, S., 26, 31, 231

 Caldecott Community, the, 86, 112, 255
 CAMPAGNAC, E. T., 276
 CANNON, W. B., 177
 CARLYLE, T., 124, 249
 CARR, H. WILDON, 21, 47, 49, 246
 CARRITT, E. F., 246
 CAVENAGH, F. A., 6, 17, 114, 165, 263
 Cell-body (nervous), 209
 Central factor, *see* Factor, general intellectual, 139 *et seq.*
 Cerebral cortex, 210
 Character, 146
 CHESTERTON, G. K., 16, 110, 262
 Child guidance, 66
 Children's conceptions, 191
 CHRISTIE, A. H., 269
 CHURCHILL, Rt. Hon. WINSTON, 80, 178, 256
 Citizenship, education for, 253, 276
 Civil Service examinations, 121, 124
 CLARKE, Sir F., 10, 12, 17, 166
 COBBETT, W., 270
 Co-education, 255

- Cognition, principles of, 51
 Cognition and action, 205-6 ; growth of, 220 *et seq.*
 COHEN, J. L., 11
 COLE, G. D. H., 114
 COLLINS, M., 120
 Complex, activity of, 56 *et seq.*, 222, 230
 Conation, conative process, 27, 37
 Concepts, nature of, 222
 Condillac's statue, 208
 Conditioned reflex, 44
 Conditioning, 30
 Conduct, development of, 194 *et seq.*; social and anti-social, 247-8
 CONS, G. J., 207
 Conscience, 200-1
 Consciousness, functions of, 63
 Conservative activities, 33, 68, 71
 Consolidation, 54, 155
 Consultative Committee (reports), 128, 276
 Conversion (sudden), 56
 COOK, H. CALDWELL, 100, 112
 Correlation, 136 *et seq.*
 Correlation of persons (Burt's method), 144
 Cortex of brain, function of, 210
 County Colleges, 95
 CRADDOCK, A. E., 112
 Creative activities, 34 *et seq.*, 68
 CROCE, B., 39, 239, 241, 246
 Crowd-psychology, 159
 Culture-spread, 153
 Curriculum, contents of, 263 ; principles of, 260 *et seq.*
 "Curriculum-making," 272
 Dalton plan, 102, 112
 Dancing, 82, 154
 DARBISHIRE, A. D., 31
 DARWIN, C., 26
 Daydreams, 61
 Deaf, intelligence of, 120
 Death-instincts (Freud), 75
 DE BARY, A., 20
 Decroly Class, 112
 Delinquency, 61, 103, 115, 203
 Dendron and dendrites (of neurone), 209
 DENT, H. C., 95, 105, 111
 DESCARTES, R., 21, 25
 Determining tendency, 52, 218, 222
 DEWEY, J., 238, 246, 276
 Diagrams, use of, 227
 Dionne Quintuplets, 115
 DIONYSIUS, 240
 Discipline, 250 ; and freedom, 100 ; mental, 261-2 ; school, 70, 250
 Disposition, primary and secondary, 42-3
 Dogmatic teaching (in religion), 267
 Dreams, 59
 DREVER, J., 80, 120, 174, 179, 180, 203
 DRIESCH, H., 20, 31, 33
 DRUMMOND, M., 203
 DUFF, J. F., 121
 EARLE, E. M., 123
 EAST, W. N. (delinquency), 115
 Educable capacity (tests of), 128
 Education Committee (L.C.C.) (report), 258
 Education of correlates, 236 ; of relations, 236
 Ego-ideal, 160, 187
 Eidetic imagery, 205
 Emotionality, 146, 175
 Emotions, 29 *et seq.*, 146, 162, 175 *et seq.*
 Energy (superfluous), 79, 82
 Engram, engram-complex (defined), 42-3
 EPICETUS, 25
 Ethical activity, 244
 Eurhythmics, 70
 Evolution and culture-spread, 153
 Examinations, 274
 Expressiveness, 39
 Extraversion, 148, 218
 FABRE, J. H., on instinct, 170
 Factor, general intellectual, 142
 general emotional, 148
 Factor-analysis, 139-46
 Factor-saturation, 142
 Factors, general nature of, 149-50
 bipolar, 147
 common, 142
 group, intellectual, 145-6
 emotional, 148
 specific, 143-5
 FAIRGRIEVE, J., 264

- Fatigue, 83
 FERRIÈRE, A., 112
 FIGGIS, J. N., 17
 Fleming Report, 255
 FLETCHER, C., 207
 FLÜGEL, J., 65, 188
 Fore-conscious level, 56
 Formal training, 124, 261
 Form psychology, 233, 246
 FRASER, A. G., 117
 FRAZER, Sir J. G., 77
 Freedom and discipline, 100
 FREEMAN, A., 78
 Free will, 19
 Frequency, types of, 129 *et seq.*
 FREUD, S., 55, 59, 67, 73, 159, 160,
 162, 168, 179, 186, 193, 200
 FROEBEL, F., 92, 190

 GALTON, Sir F., 113, 138
 GARDNER, D. E. M., 191
 GARNETT, J. C. M., 139, 146
 GASKELL, W. H., 219
 GAW, F., 120
 General education, 256-7
 General factor in ability, 142
 GENTILE, G., 272
 George Junior Republic, 103
 GERHARDS, K., 102
 Gestaltpsychologie, 233, 246
 GIERKE, O., 17
 GILLEN, F. J., 76
 Girl guides, 94, 112
 GOETHE, W., 54, 100, 243
 GOOCH, G. P., 17
 GORING, C., 127
 GOSSE, E., 192
 Greek drama, origin of, 76
 GREEN, T. H., 11
 Gregarious instinct, 193 *et seq.*
 GROOS, K., 80
 Group psychology, 159 *et seq.*
 GUGGISBERG, Sir G., 117
 GUILFORD, J. P., 152

 HAHN, K., 96, 185
 HALDANE, J. S., 32
 HALL, G. STANLEY, 46, 81, 203
 W. CLARKE, 86, 112
 HAMAIDE, A., 112
 HAMBLY, W. D., 77

 HAMILTON, E. R., 128
 Sir W., 228
 HAMLEY, H. R., 127, 261
 Handwriting, teaching of, 213-14
 HAPPOLD, F. C., 254
 HARRISON, J., 76, 78
 HART, B., 67, 90, 202
 HARTOG, M. M., 49
 Hate, psychology of, 184-5
 HAYWARD, F. H., 78, 117, 128
 HEAD, Sir H., 176, 215
 HEGEL, G. F., 3, 10
 HELVÉTIUS, 113
 Herd instinct, 11, 193 *et seq.*
 HETHERINGTON, H. J. W., 17
 Heuristic method, 102
 Hierarchy (conative), 36
 HOBBS, T., 10, 12, 17
 HOBHOUSE, L. T., 17, 203
 HOGBEN, L. T., 31
 HOLMAN, H. (on Séguin), 219
 HOLMES, E., 112
 HORNE (defined), 28
 Hormic hierarchy, 36
 patterns, 38-9
 HOWARD, B. A., 255, 271
 HUEY, E. B. (on reading), 214
 HUXLEY, J. S., 24
 Hypnosis, 162

 IBSEN, H., 97
 Ideals of life and education, 9-10
 Ideas, nature of, 226
 Identification (Freud), 160-1, 162
 Imagery, types of, 205 ; use of, 228
 Imagination, 231
 Incubation, 53
 Individual work, 106, 112
 Individuality (nature of), 18, 24
 Induction of emotion, 159-60
 Industrial Psychology (National In-
 stitute of), 123
 Infants' Schools, 190
 Initiation rites, 77
 Inner speech, 204
 Insanity, 90-2
 Instinct (defined), 171 ; schemas in,
 223
 Integration (nervous), 216
 Intellectual control, 237-8
 Intelligence and instinct, 173
 tests, 118 *et seq.*

- Intelligence quotient, 122, 134
 Interest, doctrine of, 38
 Introversion, 148, 218
 Invention, 232
 Involuntary nervous system, 210-11
 ISAACS, Rufus (Lord Reading), 53
 ISAACS, S., 110, 186, 192, 203

 JAMES, W., 30, 49, 54, 63, 83, 148, 180, 201, 217
 James-Lange theory of emotions, 162
 JENNINGS, H. S., 22, 31
 JEREMIAH, 109
 JOHNSON, Dr. S., 58
 JONES, E., 57, 67, 197, 218, 231
 Jukes family, 115
 JUNG, C. G., 28, 55, 59, 67, 148, 223

 KANDEL, I. L., 17, 111, 257
 KANT, I., 248
 KEATINGE, M. W., 9, 115, 127, 168, 178
 KELLER, HELEN, 224
 KELVIN, Lord, 227
 KIDD, B., 117
 KILPATRICK, W. H., 112
 KLEIN, M., 86
 KOFFKA, K., 246
 KÖHLER, W., 234

 Labyrinth (of ear), 215
 LANE, HOMER, 64, 103, 104
 Language, psychology of, 206, 228 *et seq.*
 LASHLEY, K. S., 215, 219
 Leadership, 160-1
 Learning by doing, 206-7
 by experience, 43
 LE BON, G., 168
 Life instincts, 75
 Little Commonwealth, 64, 103
 LOCKE, J., 113
 LOEB, J., 21, 31
 Love, psychology of, 184
 LUCRETIUS (quoted), 170
 LYNCH, A. J., 112
 LYND, ROBERT, 69, 231

 MCCLELLAND, W., 136, 139
 MACCURDY, J. T., 43, 212, 216, 219
 McDougall, 28, 47, 49, 67, 83, 159, 161, 168, 173, 176, 179, 180, 185, 187, 193, 194, 199, 200, 211
 MACIVER, R. M., 17
 McMILLAN, M., 208
 MACMUNN, N., 112
 Magic (children's), 192
 MAITLAND, F. W., 17
 Make-believe play, 90 *et seq.*
 MALEBRANCHE, N., 80
 "MALONE, NELLIE," 61 *et seq.*
 MANNHEIM, K., 17, 109, 160, 165
 MARVIN, F. S., 41
 Masochism, 179
 Maturation, 118
 MAY, D. E., 85
 Meaning, 221 ; of words, 223
 MEATH, Lord (Empire Day), 78
 Mechanistic view of life, 20-1
 Memorizing, 72
 Memory, conscious and unconscious, 26-7, 41 ; BERGSON and McDougall on, 47-8 ; lapses of, 57
 Mental age, 118 ; discipline, 261-2 ; ratio, 122 ; training, 260-1
 Mentality of apes, 234 ; of children, 191 ; of primitive peoples, 191
 MILL, J., 114, 267
 J. S., 114
 MILLER, H. CRICHTON, 67
 Mimesis (defined), 153
 Misdemeanours of children, 64
 MITCHELL, T. W., 59, 61, 67, 179
 Mneme (defined), 28 ; racial, 45-6
 Models, use of, 227
 MONTESORI, M., 92, 101, 104, 112, 190, 208, 214, 217
 MOORE, T. V., 222
 Moral education, 108 *et seq.*
 tradition, 195
 Morality, development of, 195, 200 *et seq.*, 244
 MORGAN, A. E., 95
 C. LLOYD, 22, 154, 168
 T. H., 20, 33
 MORRIS, W., 89
 MUIRHEAD, J. F., 17
 Multiple factor theory (Burt's), 145
 personality, 202
 MUMFORD, W. B., 77
 Musical ability, 143
 MYERS, C. S., 128, 171, 176, 177

- NÄGELI, C. W., 20
 Narcissism, 160, 186
 National tradition in education, 276
 Natural goodness, doctrine of, 108
 Negative self-feeling, 179
 Negro, future of, 117
 Nervous system, described, 208 *et seq.*
 Neurones, types of, 209-10
 New Education Fellowship, 111
 New ideals in education (Reports of Conferences), 64, 66, 94, 185
 NICOLL, M., 59
 Noegenetic principles, 235 *et seq.*
 Normal distribution and curve, 129 ; use of, 133 ; Note on, 150
 Northumberland tests, 121
 NORWOOD, C., 266, 276
 Norwood Report, 274
 NUNN, ELSA, 6
 Nursery schools, 189

 Obliviscence, 54
 OLDMEADOW, E. J., 242
 Order (in school), 70, 250
 Originality and imitation, 157-8, 249
 OWEN, ROBERT, 114

 PAGET, Sir R., 230
 PARKHURST, H., 102, 104, 112
 PASCAL, B., 116
 PATRICK, G. T. W., 85
 Patterns, 43, 154, 212, 222 *et seq.*
 PAVLOV, I. P., 44, 49
 PEARL, R., 23
 PEARSON, K., 137
 Perception, nature of, 222 *et seq.* ; and thought, 226 *et seq.*
 Performance tests, 120
 PERRY, J., 207
 PIAGET, J., 191-2, 203
 Pigmoid stage of development, 46, 82
 Planaria, behaviour of, 23
 PLATO, 48 ; (on art), 239 ; (on punishment), 252, 266, 268
 Play and work, 86 *et seq.* ; and art, 88
 Play-way, the, 112
 Pleasure-pain principle, 193
 POINCARÉ, H., 52
 Positive self-feeling and instinct, 179
 Posture reflexes, 215

 Practical control, 237 ; work (in teaching), 207
 Primary education, 125 ; school (defined), 70, 190
 Primary School, Report on, 191
 Primitive mentality, 191
 peoples (education of), 77
 PRINCE, MORTON, 202
 Profiles (McClelland), 136 ; (Burt), 148-9
 Project method, 270
 Propaganda, 164-5
 Psycho-analysis, 40, 67, 186, 252
 Psychological types, 148
 Punishment, 251

 RAYMONT, T., 276
 READ, CARVETH, 46, 194
 Reading, teaching of, 214
 Reality principle, 193
 Reasoning, 205-6, 219, 232-3
 Recapitulation-theory, 46, 77, 81
 Receptors, 24
 Recognition, nature of, 221
 Recreation, 84
 Reflex, conditioned, 44
 Reflexes, primary and secondary, 211-12, 219
 Regression (law of), 138, 151
 Regulation, organic and psychic, 33
 Relaxation, 84
 Religious training, 264 *et seq.*
 Reminiscence, 54
 RENDEL, L., 86
 Repetition-compulsion, 74
 Repetition, love of, 69
 in teaching, 71-2
 Repression, 56-7
 Resistance (unconscious), 60
 Rhythm, 69 ; in teaching, 269-71
 RIGNANO, E., 219
 Ritual (defined), 75
 RIVERS, W. H. R., 60, 67, 76, 153, 176
 ROUSSEAU, J. J., 109, 113
 Routine and school order, 70
 RUGG, H., 112
 RUSSELL, B., 30, 49, 112, 150

 Sadism, 108, 179
 Sampling factor theory (Thomson's), 149

- SANDIFORD, P., 29, 31, 54
 Schemas (in perception, etc.), 222
 SCHILLER, F. VON, 88
 School celebrations, 77-8
 Schools, primary and secondary,
 125; conception of, 253; board-
 ing and day, 254-5; multilateral,
 257
 Scratch reflex, 211
 Secondary education, 125, 253 *et seq.*
 SÉGUIN, E., 208, 219
 Self-assertion (defined), 32-3
 Self-feeling, positive and negative,
 179, 181-2, 251
 Self-government in schools, 111
 Self-regarding sentiment, 187, 199,
 217
 SEMON, R., 28, 42, 43, 49
 Senses, the, 215
 Sensori-motor reactions, 208 *et seq.*
 Sentiment (defined), 183
 SHAND, A. F., 183, 187, 203, 217
 SHAW, G. B., 99, 124, 158
 SHELLEY, P. B., 110
 SHERRINGTON, Sir C. S., 216, 219
 SHUMAKER, A., 112
 SIMPSON, J. H., 112
 Skill, acquirement of, 213
 SLAUGHTER, J. W., 203, 255
 SMITH, ELLIOTT, 153
 E. M., 225
 H. BOMPAS, 66, 276
 MAY, 128
 L. PEARSALL, 229, 246
 Social heredity, 116
 instinct, 193 *et seq.*
 Societies, 'closed' and 'open,' 244
 Society, the school as a, 253
 SOLLAS, W. J., 77
 SOUTHEY, R., 69
 SPEARMAN, C., 5, 65, 139, 145, 149,
 152; noegenetic principles, 235-
 7, 246
 Specific factors, 143-5
 Speech as behaviour, 206-7
 children's, 156-7
 cultivation of, 158
 SPENCER, W. B., and GILLEN, F. J., 76
 Spens Report, 261, 272, 276
 SPRANGER, E., 102, 203
 Standard deviation, 131
 scores, 132
 Stentor, behaviour of, 22-3, 41
 STEPHEN, LESLIE, 54
 STEPHENSON, W., 139
 STERN, W., 102, 189
 STEVENSON, R. L., 55, 90, 91
 STRACHAN, J., 207
 STUMPF, C., 189
 STURT, H., 222, 246
 Subjects, free choice of, 272-3
 Sublimation (defined), 64
 Suggestibility, suggestion, 162 *et seq.*
 SULLY, J., 78
 Superstition, 164
 'Suvarov Schools,' 117
 SWINBURNE, A. C., 75
 Symbolism (unconscious), 58; in
 science, poetry, etc., 230-1, 231
 Symbols, perceptual objects as, 231
 Sympathy, 161-2
 Synapses, 210, 212
 Teacher, the 'new,' 107
 Teacher's College, Columbia Uni-
 versity, 276
 Temperament, 148-9, 217-18; tests
 of, 146 *et seq.*
 TERMAN, L. T., 128
 Theology, 265
 Thinking, nature of, 226 *et seq.*, 237
 THOMPSON, Sir D'ARCY, 21
 THOMSON, G. H., 47, 112, 120, 121,
 127, 139, 144, 149, 180
 Sir J. A., 31
 Sir J. J., 207
 THORNDIKE, E. L., 54, 180
 Thought, art of, 52
 THURSTONE, L. L., 152
 Tradition in schools, 71, 197, 276
 TRAVERS, R. M. W., 11
 TROTTER, W. A., 193
 Twins, likeness in, 115
 Two-factor theory (Spearman's),
 141-3
 Unconscious invention and memory,
 26
 Unconscious, the, 55 *et seq.*, 221
 Unity in diversity, 18, 43
 VALENTINE, C. W., 48, 65, 67, 71, 73,
 74, 86, 118, 154, 156, 168, 187,
 189, 222, 229, 237

- VEBLEN, T., 195
Vocational education, 255-7; guidance, 128, 139
WALLAS, GRAHAM, 53, 70, 159, 168, 194
Waltzing rats, 215
WATSON, J. B., 29, 31, 171
WATT, H. J., 49
WAUGH, ALEC, 86
Waves of growth, 188-9
WEBB, E. (on character), 146
WELTON, J., 40
WESTERMARCK, E., 195
WEXBERG, E., 67
WHEELER, OLIVE, 203
WHITEHEAD, A. N., 99, 109, 185, 265, 271
Will, nature of, 216-17; training of, 217; forms of, 217-18
WILSON, J. DOVER (on Iago), 109
WINCH, W. H., 90
Winetka plan, 112
Wolf-cubs, 194
Words, origin of, 206-7, 229-30
WORDSWORTH, W., 260, 266
Work and play, 86 *et seq.*, 99-100
Writing, psychology of, 213-14
WUNDT, W., 246
YOUNG, E., 94
R. F., 276
ZIEMER, G., 165

